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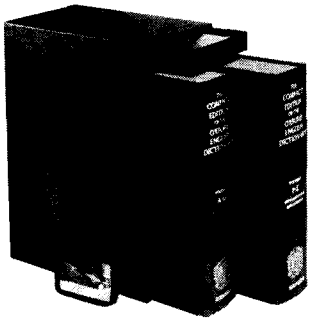

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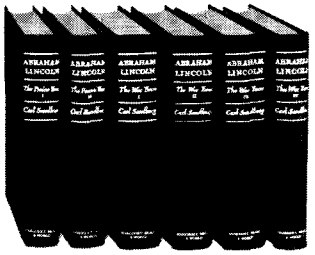

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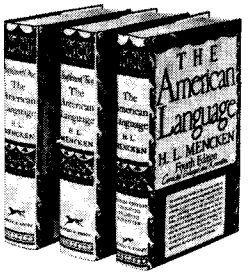

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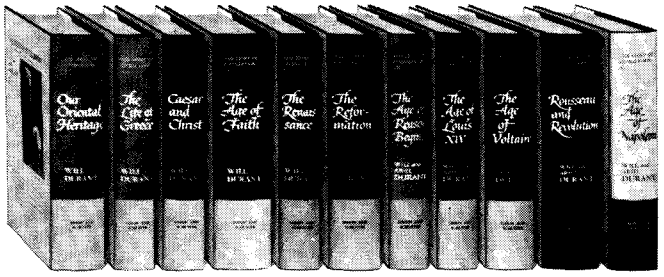

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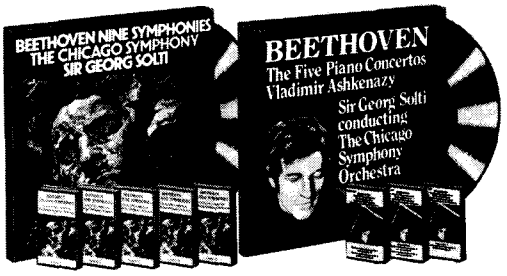

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LETTERS TO THE EDITOR

HIGH-TECH WEAPONRY

The James Fallows article, "America's High-Tech Weaponry," in the May issue is a diatribe rather than an analysis. Fallows asks, regarding sophisticated weapons systems, "How effective, how necessary are these weapons? And what do we sacrifice to own them?" He never answers, or even seriously addresses, either question.

A serious examination of necessity and effectiveness requires definition of the total requirement and of feasible alternatives for performing it. Cost comparisons and analyses of the contributions of individual technologies are meaningful only within the set of feasible alternatives. Tac Air, which received heaviest emphasis, includes both air-to-air and air-to-ground mission requirements. Fallows considers only a limited aspect (dogfighting) of the air-to-air mission, and no threat more current than the day-fighter version of the venerable Fishbed. Soviet tactical aviation today is dominated by all-weather fighters at least as sophisticated and complex as the U.S. F-4. A second generation of post-Fishbed fighters is in development and should see operational service well before production of the U.S. F-16 ends. For U.S. tactical fighters being procured now, the threat is more akin to the F-15 than to the F-5. Fighters that fall considerably short of F-15 capability cannot match that threat even in equal numbers.

W. P. MURDEN
Creve Coeur, Mo.

As an employee of McDonnell Douglas, I read with interest James Fallows's article. One very curious quote seemed paradoxical to Mr. Fallows's theme.

In a paragraph on smart anti-tank missiles, Mr. Fallows quoted an unnamed—possibly deep-throated—Pentagon official as implying that these weapons could be easily defeated by getting "a bunch of corner reflectors and . . . mount[ing] them on a bunch of motorcycles going the other way. You'd see the missiles take out after them." Who does Mr. Fallows expect will ride these motorcycles? Unnamed imbeciles? Surely he's not suggesting guided motorcycles!

GARY W. KREIE
St. Louis, Mo.

James Fallows replies:

Mr. Murden has modestly omitted his qualifications to speak on this subject; he is director of engineering technology at McDonnell Douglas, which makes the F-15. His letter is a specimen of the reasoning that has led to unduly complex weapons, with consequences I attempted to analyze in my article.

In response to Mr. Kreie's good-natured question about the motorcycle drivers, my unnamed source says that you could trail the reflectors at a great distance behind the motorcycles on little wagons, or mount them in drone boats or vehicles, or tow them behind helicopters or airplanes—or, in general, find ways to spoof the sophisticated sensors without involving soldiers in a kamikaze mission.

I find your May article on "high-tech weaponry" appalling. How can you print this calm discussion of the "kill" potentials of various types of fighter planes and the various aspects of different types of weaponry, at a time when we should be crying out against any tendencies toward a war? These planes wouldn't even have a chance to "work," because our nuclear arsenal and that of the Soviets *alone* is enough to destroy life on this planet several times over.

CAROLYN STEINHOFF
Bowie, Md.

James Fallows's article on the excesses, inadequacies, and fallacies of high-tech-weaponry spending for defense was exceptionally informative and valuable. Now, if only the budgets of the White House, State Department, and Defense Department include a few subscriptions to streamlined magazines such as *The Atlantic*, in addition to their more expensive, cumbersome, and often less useful technical publications.

TERRENCE D. COOLEY
Milwaukee, Wis.

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LIFEBOAT ETHICS

I know of no premise with which we ought more fully to agree than Garrett Hardin's in the May issue ("A Conversation With Garrett Hardin," by Harold Hayes). While it may be heartless to deny people the food to survive, is it any less heartless to feed them so that their children may starve in their stead? Some will starve in any case, and the longer we postpone it the more widespread will be the starvation.

ELDON E. JOHNSON
Fallbrook, Calif.

People like Garrett Hardin give science a bad name and make theology seem the humane alternative. His lifeboat analogy is about as appropriate to his subject as the household-budget analogy is to serious questions of national economic policy.

ERNEST NASH
Seattle, Wash.

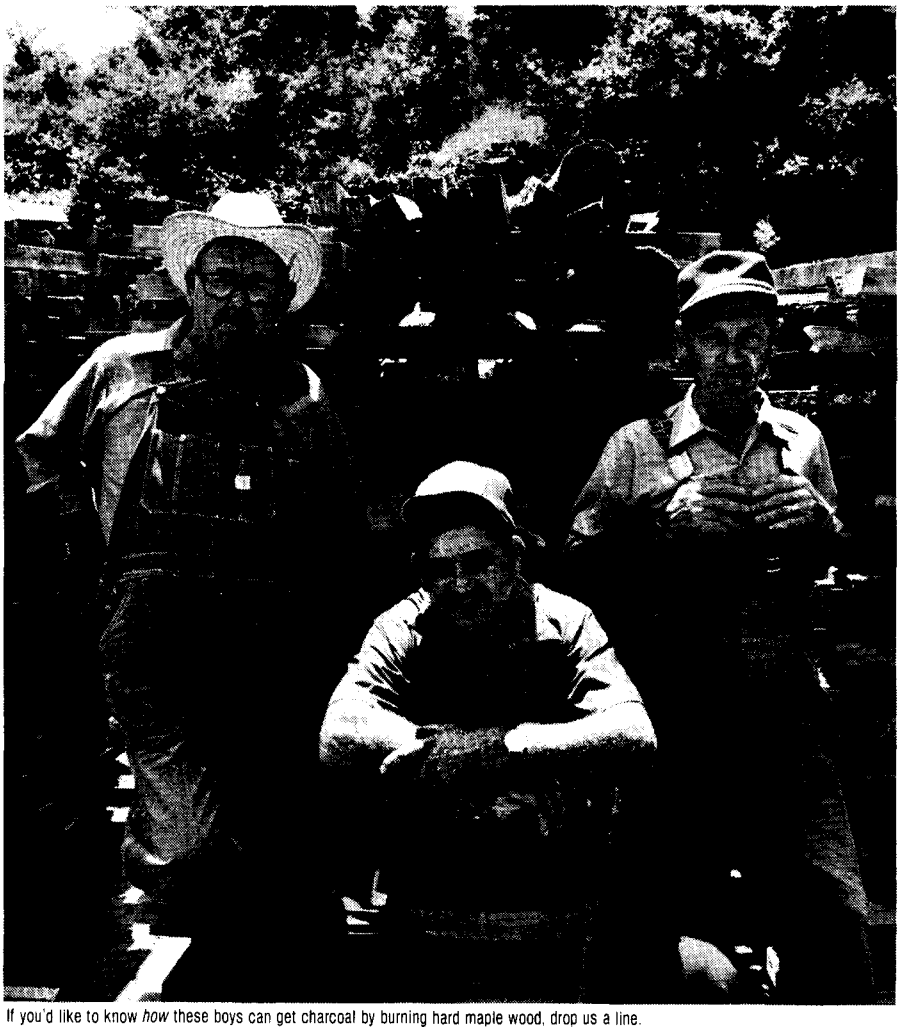
Density of population does *not* correlate with actual food supply, as is shown by comparing Holland, where most of the 326 people per hectare are well-fed, with India, where most of the 172 people per hectare are starving.

The U.S. does not give aid to countries because the inhabitants are starving. Foreign aid is a political and economic tool. It is used to develop markets for potentially price-depressing surpluses of U.S. agricultural products, to assure the U.S. access to strategic materials such as minerals and oil, and to camouflage military aid to regimes unpopular with the U.S. public.

Further, the lifeboat ethic assumes that poor countries are major food importers. On the contrary, many underdeveloped countries, controlled by minorities who benefit from export agriculture, are net exporters of high-protein foods.

ANNE JENNS
Raleigh, N.C.

Technology has made our world increasingly interdependent even as it has helped many individuals become more self-sufficient. "The survival of the fittest," which seems to be the basis of Garrett Hardin's me-first philosophy, is missing something that's crucial, at least in our Western society: the responsibility each of us has to others.



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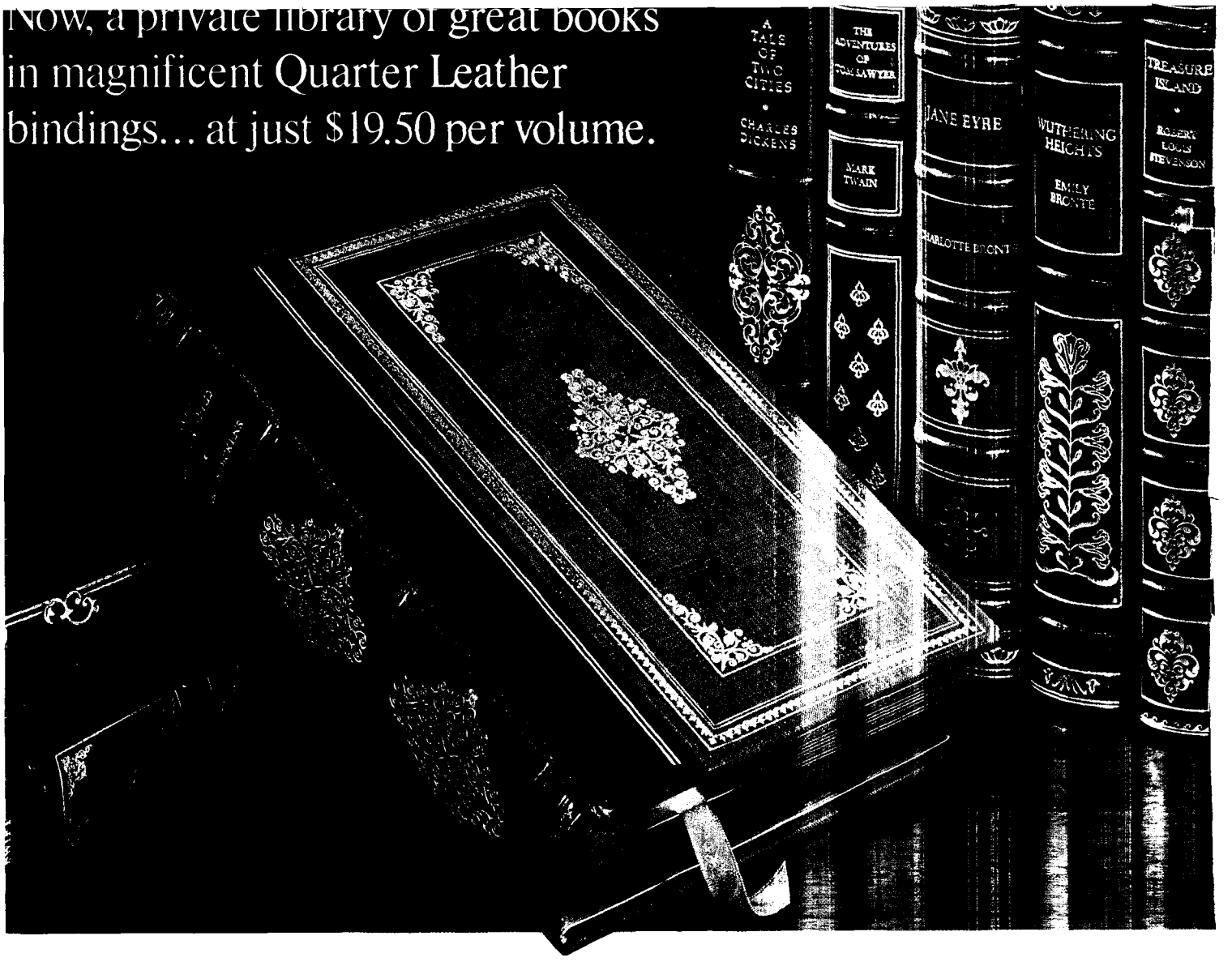

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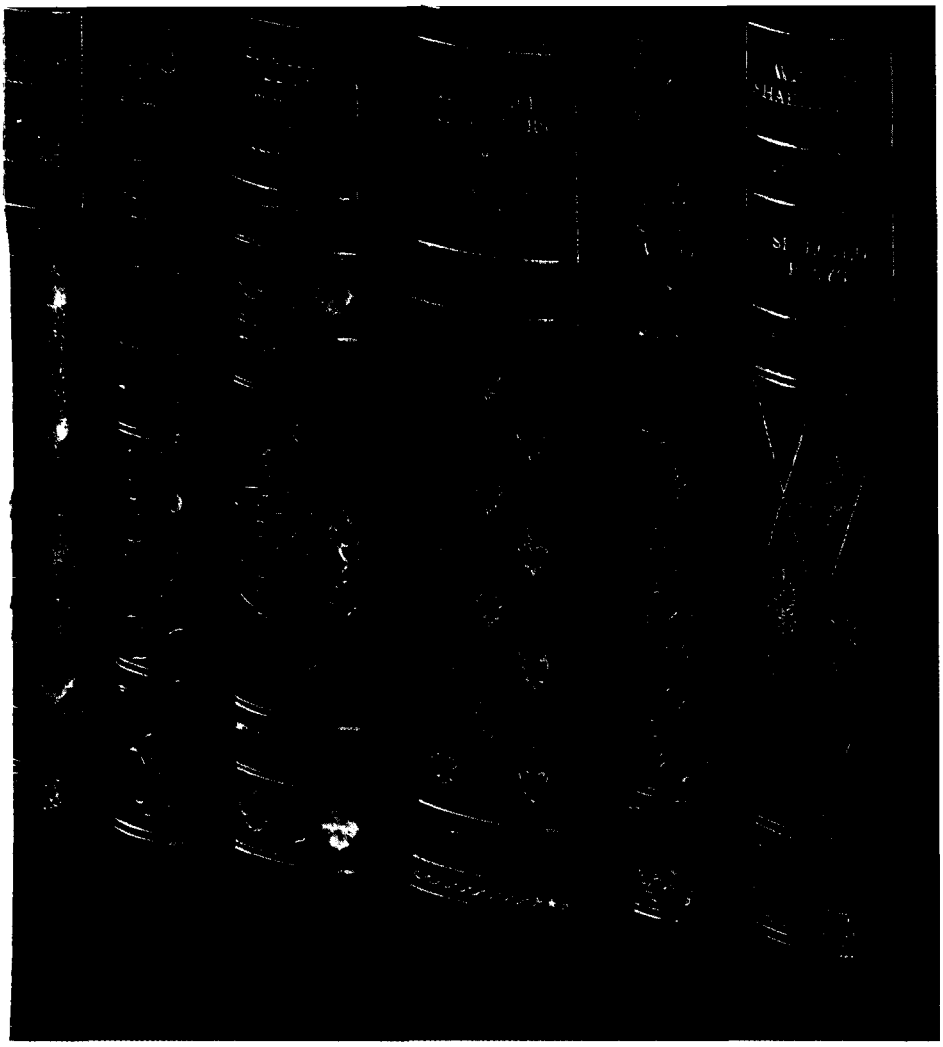

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To ignore that responsibility is to leave the hungry, crowded, and underdeveloped nations without the skills or the incentive to control their population growth and improve their chances to survive. The poor must be fed now if they are to live long enough to have the ability to feed themselves.

MICHAEL A. MAUS
Ridgewood, N.J.

If it is "quite within the rights of any nation to refuse to take aboard other people," would it not follow that we could also refuse welfare, food stamps, and Social Security to those who are already aboard and threatening to sink our economic ship? Wouldn't that balance our budget and give us more arms to protect us against the ravening hordes?

ELENA KLEIN
Redwood City, Calif.

While totally valid, Garrett Hardin's philosophies are also totally hopeless, simply because the overwhelming majority of Americans, both in and out of government, just do not have the intelligence to understand their validity.

A. ROSS MAC LEAN
San Fernando, Calif.

HOW FREE IS SPEECH?

As if there weren't enough ambiguity in the Constitution of the United States, Charles Rembar ("For Sale: Freedom of Speech," March *Atlantic*) would have us treat the First Amendment as a complex piece of poetry open to all sorts of interpretation—his interpretation being, we are to believe, the most worthy. The transparency of this notion is readily apparent—the First Amendment is clear: "Congress shall make no law . . . abridging the freedom of speech, or of the press. . . ."

But Rembar takes us through a semantic whirlwind. He asks, "And what does 'abridging' mean? Is restriction that does not amount to complete suppression included in the prohibition?" It should be obvious that to abridge and to suppress completely are two entirely different concepts. Any restriction that curtails or cuts short freedom of expression is explicitly prohibited.

Rembar tells us that though he finds it a "marvelously seductive theory," he must reject a literal interpretation. But the Constitution is a loose one not so that we might choose between a literal and a nonliteral interpretation but because it contains (for good or bad) words and phrases that beg questions. "Probable cause" and "due process" are phrases of this sort. "No law" does not fit under the rubric; "no" is one of the most universally understood of words—there is a consensus as to its meaning.

KATHLEEN TAYLOR
McLean, Va.

Charles Rembar replies:

Ms. Taylor says, "Any restriction that curtails or cuts short freedom of expression is explicitly prohibited [by the First Amendment]." No Supreme Court justice, however dogmatic his view of the Amendment, has given support to such a sweeping statement. To cite just one of many familiar examples, it has never been suggested that publishing data on wartime troopship sailings cannot be suppressed. Indeed, I cannot believe that even Ms. Taylor takes her literalism literally. The Amendment says, "Congress *shall make no law . . ." Would she hold it inapplicable to censorship by state law or by presidential order? But the substance of Ms. Taylor's letter is dealt with in the article itself and needs no point-by-point refutation, except for readers who do not have a copy of the March* Atlantic. *For them, let me say only that the article argues for more freedom of speech, not—as Ms. Taylor says—less.*

On one thing, however, she and I agree: It is true that I believe the First Amendment is "a complex piece of poetry." The law is an art, not—as some have unsuccessfully tried to make it—a science, and the Amendment is good poetry, if indeed a bit complex.

WIN SOME, LOSE SOME

I am writing to protest Walter Bernard's new design. Usually changes of this kind provide bolder and more legible type and a format for easier location of material. The new design does neither and I cannot see the merits of the changes or the need for them.

REGINALD WILSON
Vancouver, Canada

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FRANK ZAIC
Northridge, Calif.

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ADVICE & CONSENT

I congratulate you on your publication of the fine article "Getting Serious About Tax Reform" (March *Atlantic*), by Lester C. Thurow. I agree with him that we must greatly reduce the incidence of taxation on marginal work and saving.

Unfortunately, he endorsed higher taxes on personal income and spending, both of which fall heavily on the income from work and saving. He ought instead to have suggested the use of high poll taxes to replace nearly all income, payroll, sales, and other revenue taxes, which fall on work and saving. Of course, special-purpose taxes, like sales taxes on gasoline and harmful products, would still be needed, but not to raise revenue.

Poll taxes are ideal revenue taxes because they do not increase when one works harder or saves more. Thus, they do not discourage work and saving, as all income and sales taxes do.

It may be objected that some adults do not earn enough to pay high poll taxes. The same objection applies against income taxes. In both cases the solution is simple, namely, to exempt low-income receivers from taxation, either partly or completely.

BURNHAM P. BECKWITH
Palo Alto, Calif.

Charles Varon's "Wines of the Great Plains" (May *Atlantic*) had me in hysterics! There is nothing I like better than a straight-faced put-down of pomposity, and Mr. Varon did it splendidly!

GAIL S. RAVITTS
Rockford, Ill.

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REPORTS & COMMENT

EUROPE

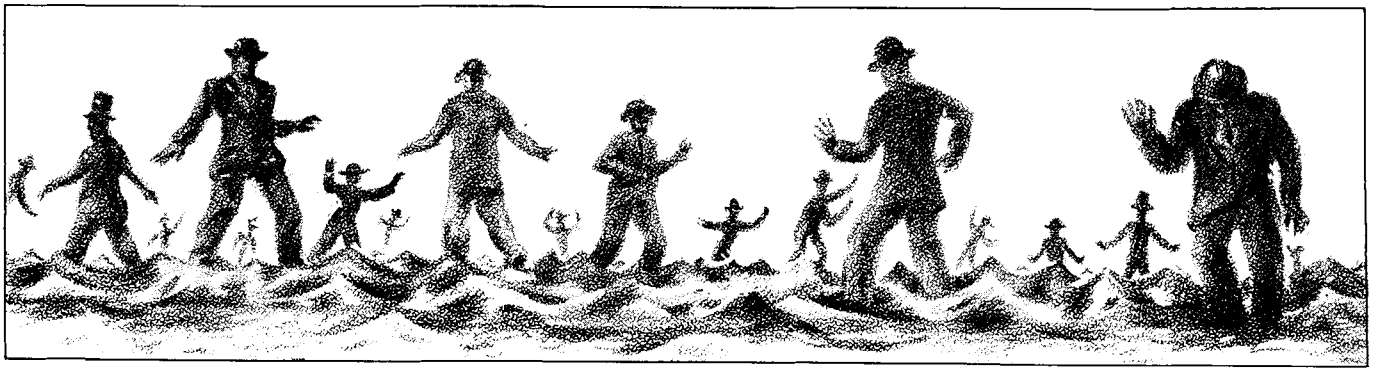
THE END OF A MIRACLE

The prescription for curing recession and inflation varies from country to country, but the results are remarkably similar

THE "ECONOMIC MIRACLE" of Western Europe has been supplanted in recent months by economic decay. Nowhere is this more evident than in West Germany, once "the industrial engine of Europe." On April 12, the five leading German economic research institutes officially declared their nation to be in the worst recession in its postwar history. They predicted that the gross national product would actually shrink by 1.5 percent this year, a decline that would be accompanied by unprecedented levels of unemployment. In prior years, Germany not only had full employment but had imported 2 million "*gastarbeiter*"—guest workers—from Turkey, Yugoslavia, and Greece to service its burgeoning industry. By last February, however, more than 1.3 million German workers were unemployed, and the number was expected to increase each month. Housing and industrial construction fell at an accelerating rate in the first quarter of this year, which indicated that there would be no immediate relief. As German exports fell, the balance of payments with other nations disintegrated, and Germany wound up 1980 with a $15 billion deficit, the largest in twenty years. And the once impregnable deutschmark has lost almost a third of its value against the dollar since the beginning of 1980.

The research institutes agreed on the causes as well as the dimensions of the German decline. They concluded that the recession and all its consequences proceeded mainly from the shock of OPEC's raising the price of crude oil by more than 50 percent during the previous year. Since Germany imports nearly all its oil, the sharply higher oil prices drained from the economy huge amounts of money that could have been used for more productive purposes. The research institutes further agreed that the effects of this oil shock were intensified by the tight-money policies of the Bundesbank, the German central bank, which made it far more difficult for German businesses to finance the added oil burden. As the economy worsened, with no relief in sight, an uncharacteristically public dispute broke out between Chancellor Helmut Schmidt, who blamed the Bundesbank for stifling the economy with high interest rates, and the Bundesbank, whose president criticized the Chancellor's plans to spend his way into increased employment.

The oil hypothesis proved a convenient and politically palatable explanation of the sudden weakness of the German economy. But OPEC could not be so easily blamed for similar phenomena occurring elsewhere in Europe. Consider, for example, the crash across the English Channel. The British recession, the most severe since the Great Depression of the 1930s, was, if anything, more serious than Germany's. By last April, unemployment had risen to 10.4 percent of the work force. More than 2.5 million workers were unemployed, with little prospect of re-employment. An additional 370,000 unemployed workers were enrolled in government retraining programs, and if these workers were



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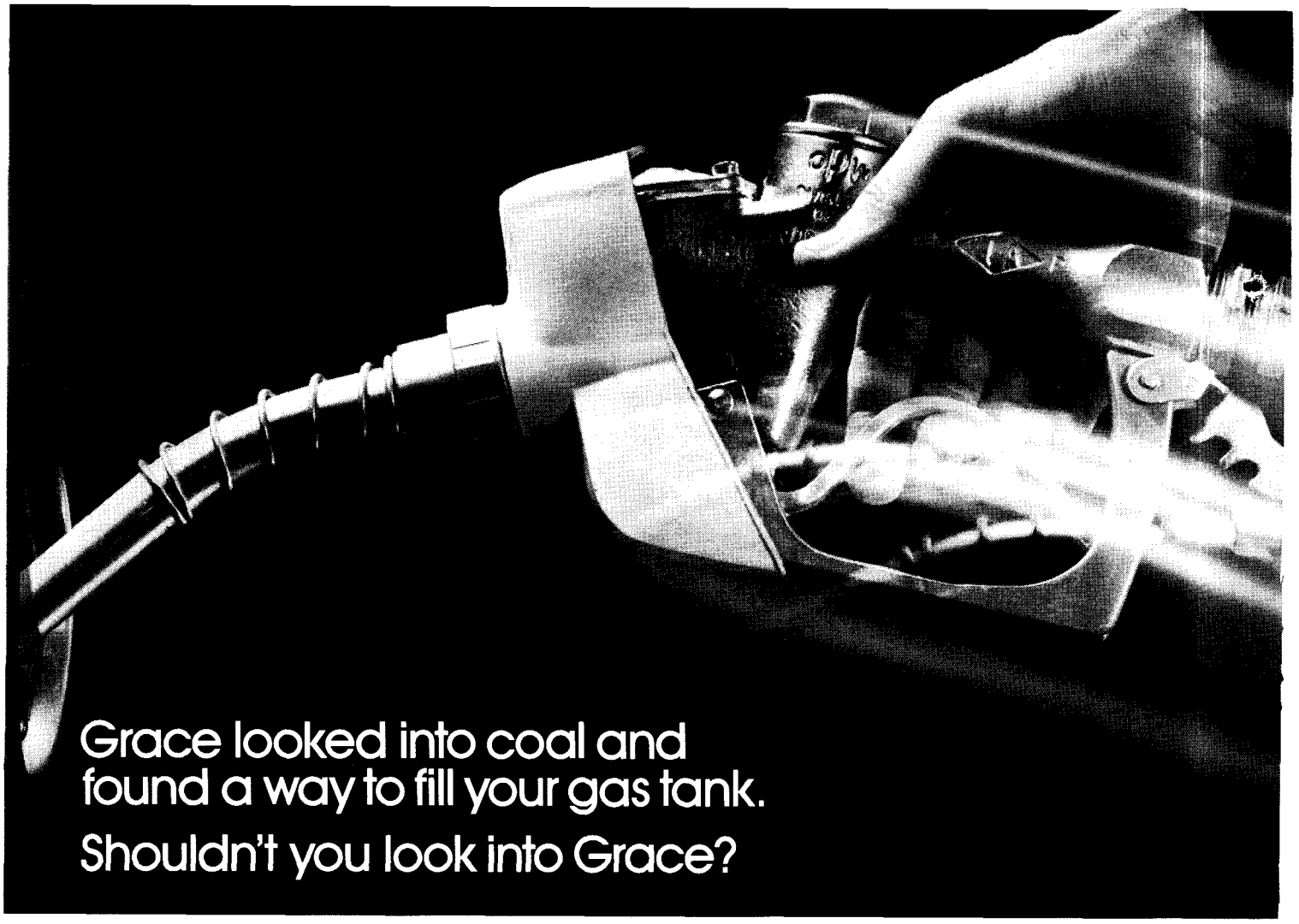

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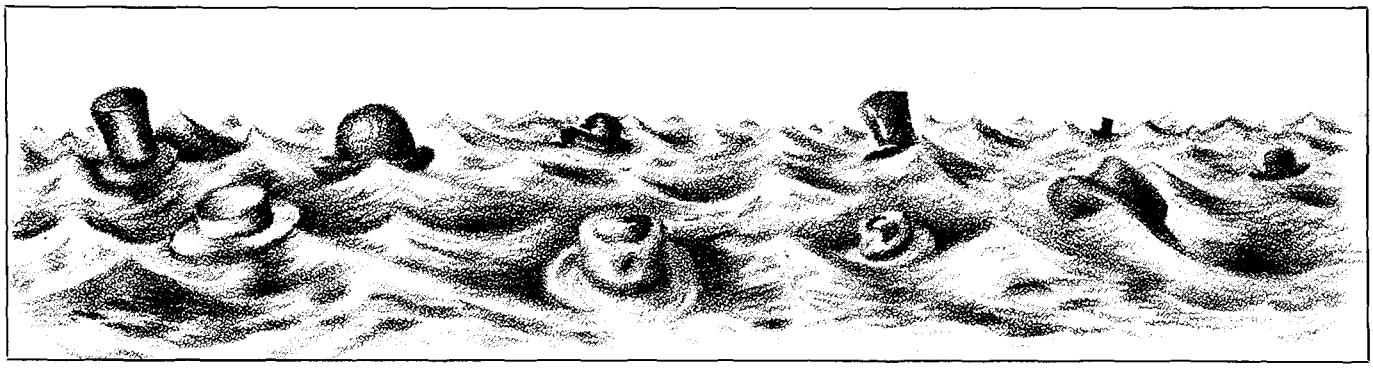

included, the unemployment rate would approach 12 percent. Indeed, there were fewer people working in England in April than at any time since World War II. And the number of workers joining the ranks of the unemployed was increasing at the rate of 65,000 a month. Not only did the entire British economy shrink in 1980 by nearly 3 percent—despite double-digit inflation—but manufacturing output declined by some 15 percent. By this spring, entire industries had begun to disappear, and the plight of many industrial cities in the north of England, Wales, and Northern Ireland could only be described as full-blown depression.

Unlike Germany, however, England was not hurt by higher oil prices. Its fields in the North Sea produced an average of 1.6 million barrels a day in 1980, making England a net exporter of oil. The OPEC oil shock, with prices increasing to more than $40 a barrel, substantially improved Britain's balance of payments, strengthened the pound, and enriched the British Treasury by more than $8 billion in taxes and royalties in 1980, more than the previous two years combined. Why, then, the economic disaster? British economists and politicians of all ideological hues were in remarkable agreement in laying responsibility squarely on the policies of the Thatcher Government. Mrs. Thatcher, an unrelenting advocate of monetarism and a species of "supply-side" economics, sought to combat inflation by slowing the growth of the money supply and by cutting both taxes and government expenditures. In her view, inflation was purely a monetary phenomenon—froth that could be blown off without spilling the glass. The unexpected result of her program, however, was an astounding increase in the money supply and the advent of soaring interest rates. Even economists in the camp of Prime Minister Thatcher more or less agreed that her policies were responsible for the collapse of the British economy. But they argued that it was necessary first to depress the economy sharply in order to drive out its inflation, and suggested that they had gone amiss only in using the wrong measure of money supply.

Back on the Continent, the Netherlands was suffering from a remarkably similar deflation of the economy, again without the burden of high oil bills. By April, the number of unemployed Dutch workers was approaching 400,000, or 8 percent of the entire work force—the largest number on the dole in the postwar history of the Netherlands. In addition, industrial output declined for 1980 by some 1.5 percent. As in Germany and England, the economic pie to be divided was getting smaller. The Netherlands also faced a $4.5 billion trade deficit—the largest in its history and still growing.

Just as England exported oil, the Netherlands exported large quantities of gas from the North Sea. Most of it went by pipeline to Germany and more than paid for imports of refined oil. The cause of the economic crisis in the Netherlands was therefore not the oil price increase. Instead, the consensus diagnosis was called "the Dutch disease"—defined by *The Economist* of London as the transfer of national wealth from productive to unproductive segments of society. Specifically, the Dutch government had followed a policy of spending the enormous proceeds from the sale of its North Sea gas on social welfare instead of allowing them to be used by business enterprises to modernize plant and machinery. The Netherlands, in other words, used its wealth for consumption rather than production—the reverse of the policy installed by Mrs. Thatcher. And yet the result was remarkably similar.

Neighboring Belgium also found itself in deep recession. In fact, by some measures its economic distress was as painful as any in the entire European Common Market. Until recently, Belgium was seen as the rich industrial core of Europe. By April, however, Belgium had an unemployment rate of 12 percent—the highest in Western Europe. Such industries as steel, textiles, and glass, which had been at the heart of Belgium's prosperity, were now operating far below capacity. Belgium already had the highest wage costs in the world, supported by powerful unions, and businesses found it impossible to produce goods competitive with those of other Common Market countries. In March, bankruptcies reached a record level. There was widespread concern that the industrial core of Europe had become an economic anachronism.

Confronted with an unprecedented $5 billion balance-of-payments deficit, the Belgian currency fell sharply, and because of this the government also fell, on April 6. Finance Minister Mark Eyskens, whose father had five times been prime minister, was called upon by the king to form a new government. Correspondents of the *Financial Times* in Brussels attributed the Belgian financial crisis to a "savage and sustained speculative attack on the Belgian franc." The new government defended its currency by suppressing the supply of money and credit.

Alone in Europe, Italy adopted the policy of pumping money into the banking system to spur economic expansion. It also held that such monetary growth was necessary to provide nationwide pay increases mandated by the "*scala mobile*," or indexed wages. The result was runaway inflation, with consumer prices rising by 32.5 percent early this year. Yet despite this permissive attitude toward the money supply (and inflation), the unemployment rate was 8.8 percent.

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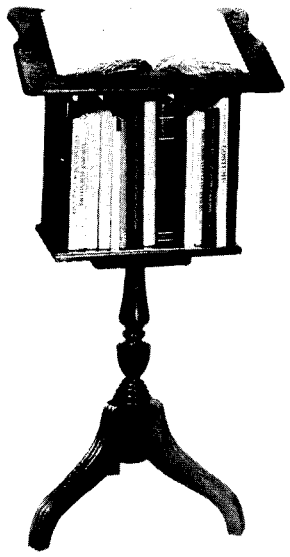

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France was not faring much better. In 1980, for the first time in twenty years, the French standard of living declined. Unemployment, which reached a record 7.4 percent this spring, became the central issue of the French presidential election. Many of the candidates blamed guest workers from Algeria and other former French colonies in Africa, and debated various methods for inducing them to return home. When the French voters made their decision on May 10, they voted in the first socialist president in the history of the Fifth Republic. It was a radical change expressing their profound feelings of economic malaise.

THROUGHOUT EUROPE, THERE has been a curious tendency to nationalize the crash of 1981. In country after country, politicians, economists, and commentators have attributed the unprecedented unemployment, declining industrial output and productivity, collapsing currencies, and uncontrollable inflation to some unique national dilemma. The diagnoses varied from place to place: the Dutch disease, the British adherence to monetarism, the German love affair with a strong currency, the financial incompetence of the Italians. But the assumption prevailed in each country that its economic malaise proceeded directly from the current policy of its own government and could be cured by an opposite policy. Yet it seemed to make little difference in the national unemployment rate whether a government followed an excessively tight monetary policy, as did the British, or an excessively loose one, as did the Italian. Nor did it seem to matter whether a government aimed at stimulating private business, as did the French, or at expanding the public sector, as did the Dutch.

Was this the classic problem of blind men manually examining the various extremities of an elephant? If so, the elephant in this case appears to be a European recession of startling proportions. And if one considers Western Europe as a single economic entity, rather than as a variety of sovereign parts, the shape of this elephant emerges more clearly.

In the early 1970s, the Common Market (officially the European Economic Community, or EEC) held out the prospect of becoming the most powerful industrial entity in the world, fueled by North Sea oil and the coal mines of the Ruhr. By 1973, it had subsumed in a giant customs union the economies of nine nations—West Germany, France, Great Britain, Italy, Belgium, Luxembourg, the Netherlands, Denmark, and Ireland. Its combined population was nearly a quarter of a billion people, and its gross national product approached $800 billion. Its economic growth had been truly remarkable: in the preceding fifteen years, the combined output of these nations had more than quadrupled. Unemployment averaged only 2.5 percent in 1973, and workers had to be imported into the Common Market from poorer nations.

By early this year, economic growth had all but halted. Industrial output was dropping at an annual rate of more than 6 percent. Unemployment had risen throughout the Common Market to nearly 7 percent, while inflation remained at more than 12 percent. The Common Market's trade deficit with the rest of the world had doubled from the preceding year, and the ecu, which is the nominal currency of the Common Market, had lost 16 percent of its value against the U.S. dollar from the previous year. Several EEC members had begun to resort to covert forms of protectionism against fellow members of a union whose guiding principle was free and open trade.

What had happened to Europe's miracle? The important economic indicators appeared to show a decline so uniform and ubiquitous that the various actions of individual governments—which themselves were often contradictory—hardly seemed relevant. The real question was whether this downturn was merely a cyclical recession or the beginning of a permanent decline in the fortunes of Western Europe.

Edward M. Bernstein, the Washington economist who was the first research director of the International Monetary Fund and a principal architect of the Bretton Woods monetary system, said recently that the tide of progress was no longer running with Europe. He pointed out that the most powerful force behind the postwar miracle was the sweeping shift in Europe from agriculture to industry. The migration of workers from farms to factories resulted in higher wages, production, and consumption. It was, however, as Bernstein put it, a "once-and-for-all event." Europe could no longer expect

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the industrialization of the rural sector to fuel its economic growth. In this view, Europe's miracle would not automatically resume when the worst of the current decline was over.

Moreover, the balance of international trade is now running heavily against Europe. In 1978, the Common Market exported to the outside world almost as much as it imported, and despite the need of most of its members to fill their energy requirements elsewhere, the EEC ran a deficit of only $3 billion. Then, in 1979, exports began to wane and the deficit rose to $28.5 billion. Finally, in 1980, the deficit jumped to $61 billion, much of which had to be financed by government borrowing at near-record interest rates. To be sure, a major part of the deficit could be blamed on rising oil prices, but cheap oil was a relic of a bygone era. And the future holds no promise of improvement. As North Sea oil and gas rapidly deplete in the 1980s and 1990s and the coal fields of the Ruhr become progressively more expensive to mine, Europe's energy bill will drastically increase.

The shifting balance of world economic power has to do with considerably more than the cost of imported energy. The structure of extraordinarily high wages and fringe benefits in the EEC, which was built on the expectation that Europe's miracle would go on forever, has resulted in pricing many European products out of world markets. European shipbuilding is virtually dead (with Japan producing half the ships in world trade); European steel mills find it almost impossible to compete with more modern plants in the Pacific Basin; European textile mills are losing out to Taiwan and Hong Kong; and European chemicals and synthetic fibers have to face cheaper competition from Eastern European plants that are unconcerned with conventional measures of profit and loss. The disappearance of Europe's competitive edge is especially evident in the automotive industry, where, for example, Germany pays its workers 60 percent more per hour than Japan pays its workers. Indeed, the irreversibility of the high built-in labor costs in the Common Market has compelled economists, such as Lawrence Krause, of the Brookings Institution in Washington, to predict that many EEC core industries may be forced to migrate to cheaper labor zones in Spain, Greece, and Turkey.

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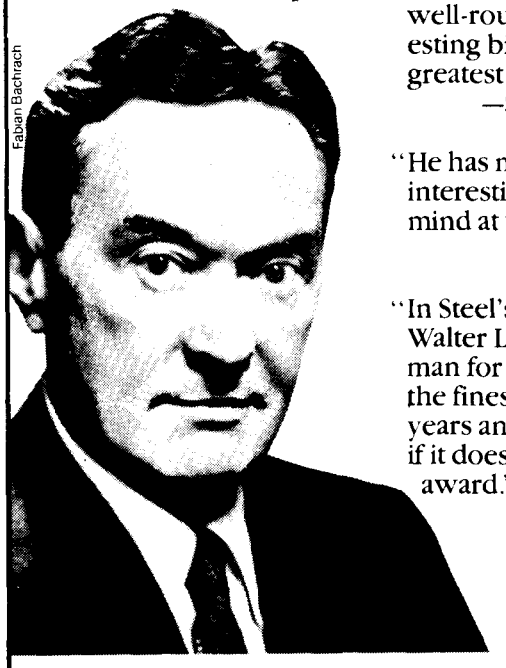
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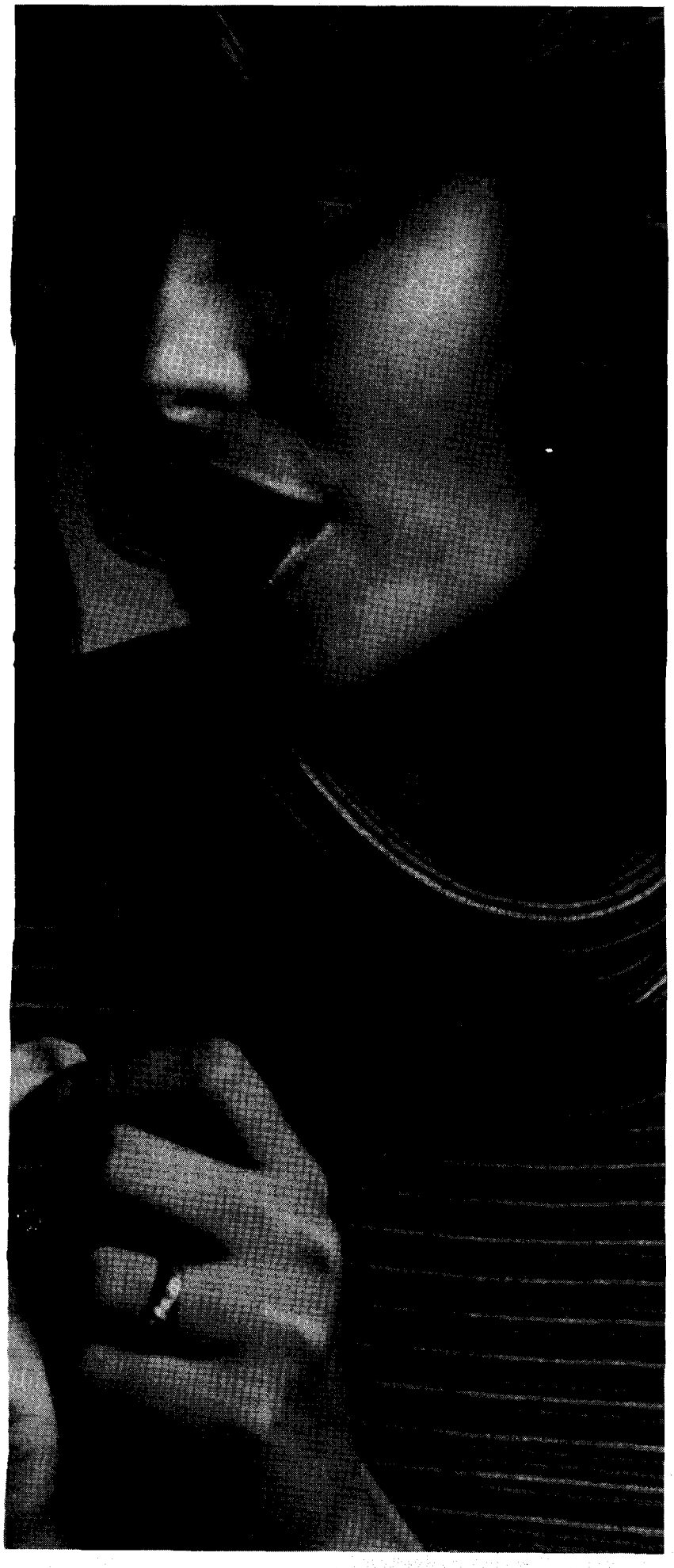

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More alarming, the Europeans are also losing the high-technology race in product development. The Japanese, once ridiculed as copycats, are rapidly becoming innovators in new technologies. Japan-watchers such as Herbert Passim, professor of sociology at Columbia University, are now confidently predicting that Japan will surpass Europe in creating sophisticated new industries in everything from genetic engineering to main-frame computers. This, and American dominance of defense and space technology, could leave Europe dependent on its declining base of heavy industry.

Finally, Europe has had to adjust to a redrawn geopolitical map of the world. Zaire is no longer the private elephant park of a Belgian king; the Persian Gulf has ceased to be a British-occupied pond (Britain removed most of its military forces from the Strait of Hormuz and the Trucial States only in the 1970s); and Algeria is no longer part of metropolitan France. The colonies cannot be relied on as cheap sources of raw materials or as captive markets. But even worse, former colonies can now compete directly with former motherlands.

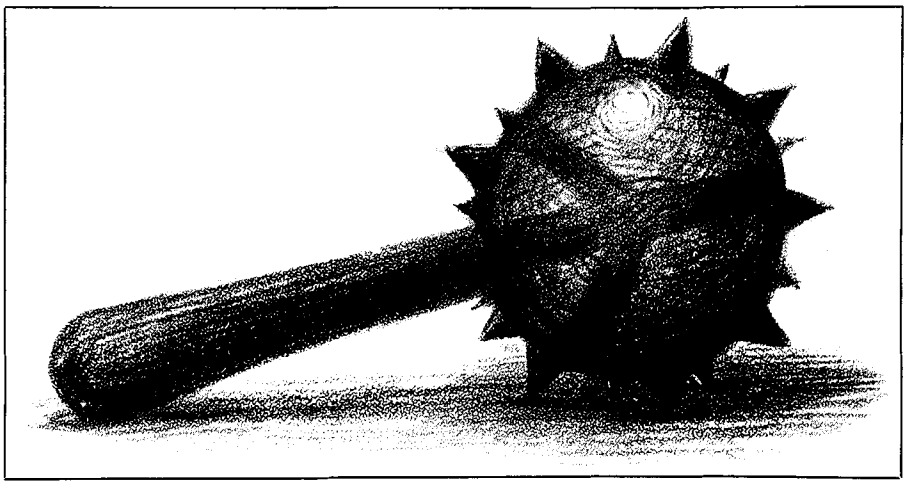
As Nathaniel Samuels, a director of Lehman Brothers Kuhn Loeb, suggested recently, new and highly sophisticated industries such as electronics can be set up almost as easily in less-developed countries as in Europe. And the Common Market cannot continue to count on expanded trade with the communist nations of Eastern Europe.

After the Polish uprising (and a less-publicized Rumanian economic purge early this year), West European businessmen had to make drastic changes in their assumptions about the reliability of their East European trading partners. Because of political unrest and other internal factors, Eastern Europe is being forced to divert resources from the production of export goods to domestic consumption; its trade balance is growing increasingly precarious—and its ability to repay loans is increasingly doubtful. Western banks had little choice in April but to agree to "reschedule"—or defer for years—Poland's payments on its $25 billion debt. (And in the future the debts of Rumania, Hungary, and Yugoslavia—collectively another $32 billion—may double the problem.)

Western Europe, caught between increased competition from the Pacific Basin and diminishing markets in the Third World and Eastern Europe, appears to have reached the end of its miracle. Some European leaders have found it convenient to blame OPEC or high American interest rates or each other. And the optimists among them, believing that what goes down must come up, wait complacently for the business cycle to lift their economies from trough to peak again. None of them seems willing to appreciate that it is the nature of miracles to come only once.

—Edward Jay Epstein and Jeffrey Steingarten

Edward Jay Epstein is the author of Between Fact and Fiction, Agency of Fear, *and other books. Jeffrey Steingarten is a lawyer living in New York.*



WASHINGTON

THE VIETNAM GENERATION

The skirmish over a presidential nomination reveals the chasm between those who fought and those who stayed home

THOMAS PAUKEN IS a thirty-seven-year-old lawyer from Dallas. As a student at Georgetown University in the 1960s, he was active in conservative politics, and in 1965 he became the national chairman of the College Republicans. In the 1970s, after serving in the Army in Vietnam and completing law school at Southern Methodist University, he became active in Dallas politics and ran twice as a Republican for the congressional seat held by Representative Jim Mattox, losing narrowly both times. Early this year, Thomas Pauken became President Reagan's nominee to run ACTION, the federal agency that oversees a number of volunteer programs, including, in an indirect way, the Peace Corps.

The Senate confirmed Pauken's nomination by a voice vote on May 7, but only after a portentous struggle. It was often said during the Senate hearings on Alexander Haig's appointment as secretary of state that arguments about his fitness were really continuations of old arguments about Watergate. To a significant degree, the controversy over Pauken was a resumption of disagreements about Vietnam. Although the Pauken case is settled, the divisions it revealed imply that, unlike Watergate, Vietnam may be a source of more, not less, friction in coming years.

Nothing in Pauken's appearance suggested his vulnerability as a nominee. He is a square-faced man of medium height and build, with orderly black hair and a salesman's ready smile. Seen in his offices at ACTION during the controversy over his appointment, he seemed to be a classic specimen of the enthusiastic movers and self-improvers who have always made up the Republican Party's greatest pool of young talent. He was a success in the law before turning to politics; he did his part for Dallas, through the United Way and other volunteer groups. He is happily married and is the father of five children, the oldest of whom is six; he has an honorable record of military service. The last was the problem.

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The complaint against Pauken turned on the choices he had made during the Vietnam War. Pauken volunteered for the Army early in 1967 and served for nearly three years. Throughout that period he was an officer in Army intelligence. He spent most of his first two years in training—at the Army's intelligence school, at Ft. Holabird, Maryland, then at language school in El Paso, then again at Ft. Holabird. Early in 1969, he went to Vietnam, where he began as a "province intelligence officer" in the Mekong Delta and later became a "senior analyst" with the Strategic Research and Analysis division in Saigon. While he was stationed in the delta, his work consisted of collecting "order of battle" information—specific reports about the nature of troops and equipment that enemy forces possessed. In Saigon, he prepared research reports on subjects such as communist revolutionary strategy and the North Vietnamese theorist Truong Chinh.

Seen from the perspective of those devoted to the Peace Corps, the case against Pauken was open and shut. The Peace Corps was established in the first days of the New Frontier, when intelligence operations in general and the CIA in particular had more respectability and cachet than they have since enjoyed. One of the Peace Corps's major struggles in self-definition had been to keep itself free of connections with the spies. From the beginning, it extracted an extraordinary promise of immunity from the intelligence agencies: alone among American organizations operating overseas, it would be protected from all attempts at penetration by the CIA. The policies of the Corps prohibit any former CIA employee from working on its staff or as a volunteer; there is also a ten-year waiting period before anyone who has worked in any intelligence organization can apply for a position with the Peace Corps. For their part, the intelligence agencies reciprocated with a promise not to hire former Peace Corps volunteers.

"The policies were set up knowing that Peace Corps volunteers and staff would be accused of being agents of American intelligence," William Josephson, who was the Peace Corps's general counsel in the early 1960s and now practices law in New York, told the Senate committee considering Pauken's nomination this spring. "We decided

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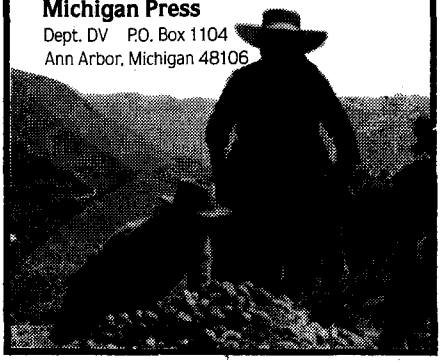

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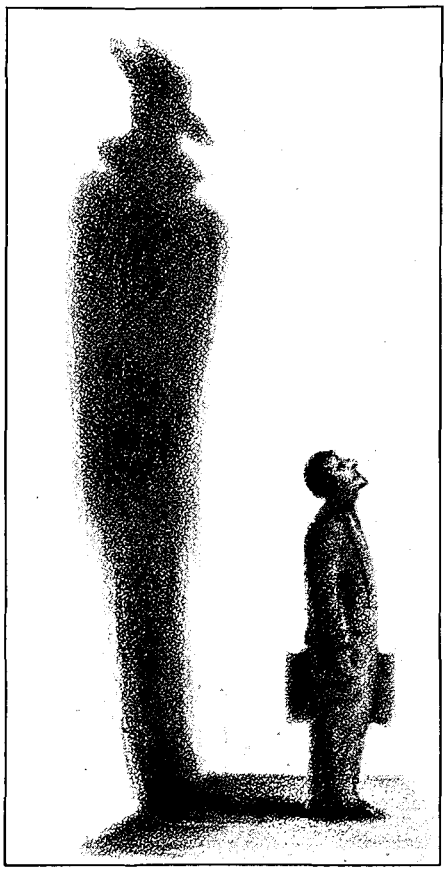


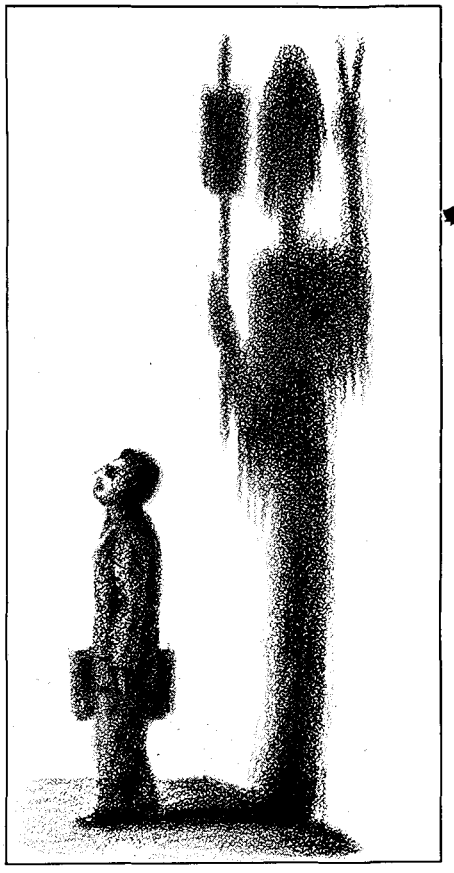
. . . that we had to deny any kind of credence to the charges, the false charges, that we knew would be made."

When news of Pauken's nomination traveled through the Peace Corps network, there was widespread reaction against this apparent breach in the dam between the volunteers and the intelligence agents. Petitions were presented to the Congress and letters mailed to the press concerning the danger Pauken's selection might pose to those who represent the Peace Corps overseas. Volunteers who had returned from service in Afghanistan, Angola, Kenya, the Philippines, and elsewhere submitted affidavits about the way that local suspicion of their motives had constantly undermined their work. "The extreme sensitivity of Turks—rightist, leftist, and centrist—to any thought of American intelligence activities cannot be overemphasized," a former volunteer named Margaret Gall wrote. "I think it would be disastrous for any link, public or private, to be forged between Peace Corps and U.S. intelligence activities." Another said, "I was usually able to explain that the Peace Corps was in no way associated with intelligence activities . . . Some volunteers weren't so lucky. Bill Ward, a volunteer in Yemen, was beaten by local men who mistook his curiosity about their country and culture to be signs of intelligence involvement."

One young senator who has served in the Peace Corps, Paul Tsongas, of Massachusetts, raised what became known as the "blood on our hands" question: "I think the major issue is the physical security of the volunteers . . . I don't think that people's lives potentially should be put into the balance."

Resistance to Pauken's nomination increased after Senator Alan Cranston, a Democrat from California who once was an evaluator for the Peace Corps and who led the opposition, obtained Pauken's military records and, much to the nominee's displeasure, made their contents known. The "officer efficiency reports" for Pauken's tenure in Vietnam said that he had been a "team chief in a unilateral clandestine intelligence collection operation" and "team chief of an intelligence collection team engaged in covert intelligence operations." William Josephson told the Senate committee that such covert service "converts what would have been a clear case of disqualification when I was general counsel for the Peace Corps into an absolutely unquestionable case. He could not have served in the Peace Corps had I been general counsel under any circumstances." Josephson then summarized the case against Pauken: "If the Senate gives its advice and consent to Mr. Pauken's nomination, and if the President appoints him director of ACTION, for the first time, to my knowledge, the United States will have acted knowingly—however unintentionally—but knowingly to lend credence to the false charge that the Peace Corps is an arm of United States intelligence."

The forces opposing Pauken obviously had a point. This particular match-up of man and job created wholly unnecessary problems, not only for the Peace Corps but also for Pauken himself. Although Pauken gamely insisted through the worst of it that this was the job he'd always wanted and that he had no second thoughts, several of his friends suggested that it might have been better all around if he had pinned his hopes on running, say, the Small Business Administration instead. But some of those same friends seemed to find it hard to place full faith in their opponents' assurances that there was



nothing personal in the attacks on Pauken. In their view, the heart of the matter was the political and social tensions within their generation that have been unresolved since the Vietnam War.

THE ISSUE WAS personified in the contrast between Pauken and the man he believed to be his central antagonist, Jonathan Steinberg. Steinberg is five years older than Pauken and also a lawyer. He was educated at Cornell and the University of Pennsylvania Law School, and he has served as a Senate assistant in one capacity or another since 1969, most recently as counsel for the Veterans Affairs Committee, which Alan Cranston chaired when the Democrats controlled the Senate. From 1964 to 1969, while Pauken was giving speeches for conservative causes and entering the Army, Steinberg was working in Washington for the Peace Corps, and he finally became its deputy general counsel. Pauken would fit easily into a crowd of ambitious business and professional men in Dallas; Steinberg is lanky and curly-haired, with the confident bearing typical of Capitol Hill assistants. If Pauken represents everything that the Peace Corps alumni say

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they oppose, Steinberg represents the part of his generation from which Pauken feels estranged.

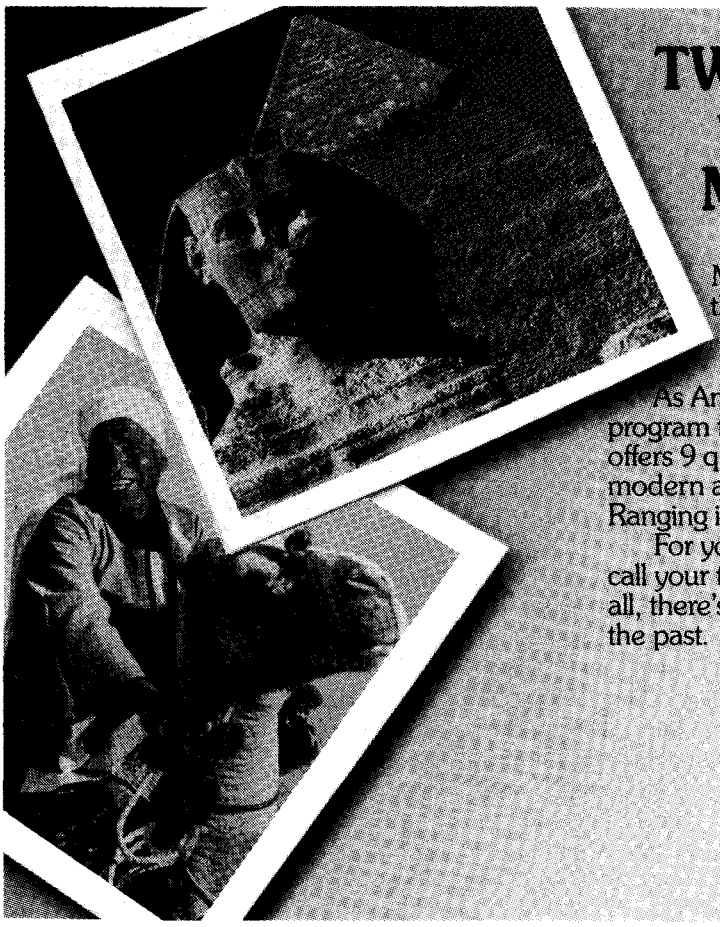
"There is no question but that the entire campaign against me has been led, organized, directed, and manipulated by Jonathan Steinberg," Pauken said shortly before the vote on his confirmation. "My personal opinion is that he is still fighting the Vietnam War."

Such an interpretation of events arose naturally from the special preoccupations that Pauken and others like him brought to the case. If the Peace Corps is super-sensitive to even the appearance of contamination, many Vietnam veterans are correspondingly alert to seeming slurs directed at their service in the war. This is especially so when the slurs come from that part of their generation that, in condemning the war, at least temporarily condemned the warrior. Pauken's predecessor at ACTION was Sam Brown, who organized anti-war movements in the 1960s. "To many people, I am the worst possible symbol as a successor to him," Pauken said. "The combination of my political activism and my military service means there would have been hostility to me in any case. The intelligence question just gives them a hook to hang it on."

The most outspoken of Pauken's supporters was John P. Wheeler III, a West Point graduate and, like Pauken, a non-combat veteran of Vietnam who left the military to become a lawyer. Over the past few years, Wheeler has frequently advanced the idea that Vietnam produced a "wounded generation," made up of groups who mistrust each other and, unable to express their suspicions, let them fester instead. Wheeler detected a slight in the tone that Peace Corps volunteers used to denounce Pauken at the Senate hearings. "They all say that their organization stands for commitment, sacrifice, love, dedication, and imply that therefore someone like Tom Pauken is an inappropriate director. The argument by omission is that soldiers do not know about commitment, sacrifice, love, dedication. There's absolutely no awareness that self-giving was the essence of men in combat."

The clinching evidence, Wheeler said, was that the men who were at the hearings said they *felt* it. "This feeling of personal disesteem was just radiating off Steinberg. If anyone thinks that is a frivolous argument, he ought to look at the cases of sexual harassment at the office, where innuendo, facial expression, muscle tone, and body language are considered to convey meaning . . . Tom was being treated as an object, and . . . his military service was being considered as something dirty and dishonorable." Nearly all of Pauken's opponents contended that they would be happy to confirm him for any government job other than this one. They argued that the facts of this case made it the worst possible test for feelings about Vietnam veterans. Wheeler said that, on the contrary, it was the best test case: "Only when they have this kind of factual opening will they feel justified in making the attack."

To these complaints Steinberg replied, in essence, "Hogwash." At roughly the same time as the Pauken controversy, President Reagan nominated a man who had served eight and a half years as a prisoner of war in Vietnam to be deputy director of the Peace Corps. No objections were heard. If anti-veteranism were really the issue, Steinberg



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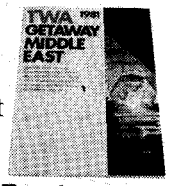

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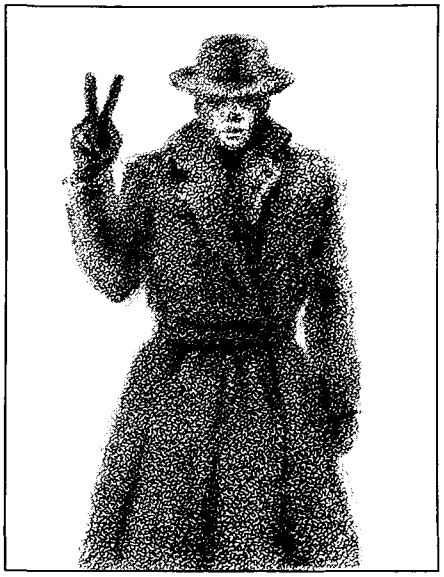
said, this nominee too would have been vigorously opposed. Steinberg also frequently mentioned Alan Cranston's role in the dispute. Who, he asked, has done more for Vietnam veterans than Cranston?

"They're happy to do things *for* veterans," Pauken responded. "They're only really comfortable treating Vietnam veterans like victims. If you don't fit into the stereotype of the wounded puppy, so they can pat you on the head and give you a few scraps, they're uncomfortable." Wheeler said, "This is the first time I've seen where some really able people who wore the uniform have gathered not to discuss the veterans as victims but to do something positive. It is an act that promises political power. Therefore it could be misunderstood as threatening."

THE ARGUMENT ABOUT anti-soldierism can readily be overstated. Without judging Pauken too harshly, it is easy to imagine that this theme assumed such prominence in his mind only after he saw that it could be relied upon for mileage in the press. But, if asked to choose between Pauken's assertion that the passions generated by his nomination included a considerable element of refighting the last war and the other side's denial that Vietnam was a factor at all, I would find Pauken's the more believable view.

It is even more obvious that each side to the dispute had tremendous difficulty comprehending the other's experience or view of the world. Pauken was at his most amusing when describing the difference between "intelligence work" as those who have served only in the Peace Corps imagine it and intelligence work as he saw it in Vietnam. Scott Armstrong, a Washington *Post* investigative reporter, talked to some of Pauken's associates from Vietnam and determined that he had been "managing . . . a network of agents" in the delta. Pauken recalls that one of the crack agents in his network was in business only to extort enough money to start a chicken farm. "The reason I transferred out of the delta was to start doing something worthwhile," he says. "The only substantive work I did in Vietnam was the strategic analysis. I just hope somebody read it." Cranston accused Pauken of deception, because he told the committee that he "happened" to be assigned to intelligence, whereas his service records showed that he requested it. "What they don't realize is that the Army would ask who was interested in foreign policy or learning a language, and all the wise guys who said they were interested found out later that they had 'requested' intelligence. Somebody came up to me during the recess at Holabird and said, 'You must have had the same Army recruiter I did.' " Pauken's military records contain mention of "covert" and "clandestine" activities. He says that his opponents took such references as evidence that he was a James Bond figure, but that "It was really like *Our Man in Havana*."

Yet when Pauken and his friends



view the other side, they, like their opponents, see cartoon versions of reality. Pauken says that his background should not matter, because an executive order issued by Jimmy Carter in 1979 empowered the Peace Corps director to report to the President rather than to the head of ACTION. Those who have worked as volunteers say this reveals a wild misunderstanding of the realities. William Josephson said, "I can just imagine a guy who's captured in Afghanistan, as a volunteer recently was, trying to explain the provisions of the executive order to the people holding a gun to his head and saying he's a spy." Pauken takes the New Left quite seriously as a continuing force in American politics. In 1979, he prepared a documentary film on Tom Hayden, and he sees Hayden as the man who will reemerge to lead a movement of "Left Populism" in the 1980s. The look of concern with which he makes these points is matched by Pauken's opponents when they say that Soviet intelligence undoubtedly has records of everyone who has passed through Ft. Holabird.

Intra-generational strife emerged in the Senate when it considered Pauken's case. Paul Tsongas, who served in the Peace Corps in Ethiopia, vividly rendered the details of life in the bush: "If the committee members could consider themselves living in a village in a Third World nation, totally at the mercy, in terms of physical security, of how the people felt about you, they might reconsider. There are no emergency rooms, there is no protection of any kind, and your life hangs on whether people think you are there for good or for ill." Senator Larry Pressler of South Dakota, who was in the Army in Vietnam, tried to knock down portrayals of Pauken as a master spy: "His efficiency reports . . . said he participated in 'covert' intelligence activities. Well, regarding efficiency reports, let me say that when I read about what I did in Vietnam, it sounds as though I was running the whole show." Senator Christopher Dodd had joined the Army after his Peace Corps service and had been turned down in his application for Army intelligence precisely because of his background as a volunteer. On that precedent, he voted against Pauken. Except for Dodd, the partisans on both sides had difficulty understanding the realities their opponents attempted to describe.

For the Peace Corps, the case of Thomas Pauken will probably amount to a furor that quickly comes and goes. Even without the legislation that would completely separate the Peace Corps from ACTION, proposed by Senator Cranston, the dispute left Pauken with little choice but to take a ten-foot-pole policy toward the Peace Corps. For the generation to which Pauken belongs, the case may be more significant. As the children of the baby boom—those of college and military age during Vietnam—move through their thirties and forties, they will be grabbing harder for bigger brass rings. The misunderstandings and hostilities left over from the 1960s are likely to give that competition a nasty edge.

—James Fallows

James Fallows is Washington editor of The Atlantic.

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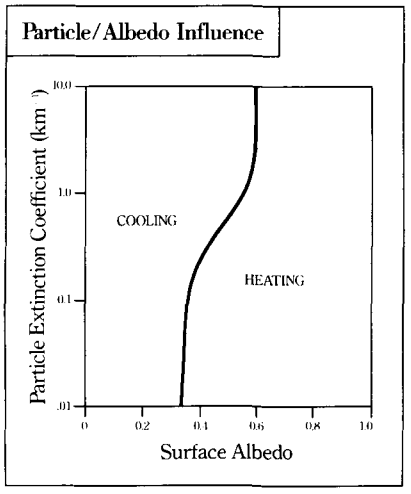
The Albedo Effect

Mathematical models of the atmosphere are the chief scientific tools for predicting long-term climate and identifying possible climatic changes that may result from man's activities. Recent advances at the General Motors Research Laboratories have revealed new information about the contribution of airborne particles to the delicate thermal balance of the earth's atmosphere.



Regions of heating and cooling determined by particle characteristics and surface albedo.

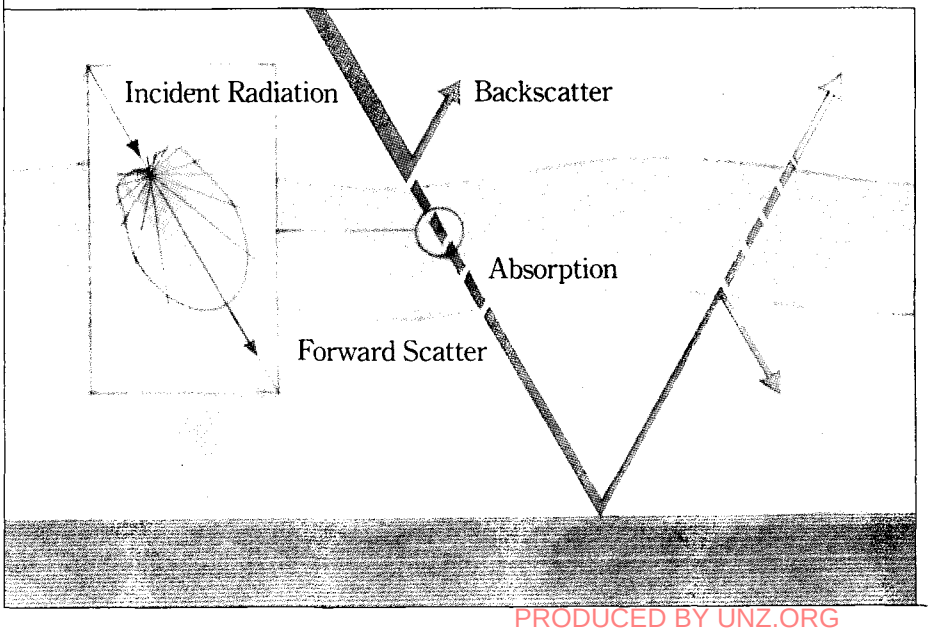
DEVOID of its atmosphere, the bare earth would reach an average temperature of only −1°C. Atmospheric interaction with solar and terrestrial radiation raises the average surface temperature to fifteen degrees Celsius, making life as we know it possible. Small fluctuations in overall temperature can have large-scale effects. It is believed that a drop of a few degrees Celsius lasting for a period as short as four years could trigger an ice age. Fundamental studies conducted at the General Motors Research Laboratories explore the effect of various atmospheric factors, natural and man-made, on the earth's thermal balance.

New knowledge of the influence of airborne particles on the earth's thermal balance has been revealed by investigations carried out by Dr. Ruth Reck. Dr. Reck's work at General Motors integrated for the first time the complex factor of particles into radiative-convective atmospheric models. Her findings help determine under what conditions particles have a cooling influence, and under what conditions they have a heating influence.

Airborne particles have many sources: volcanic issue, wind-raised dust and sea salt, ash, soot, direct and indirect products of combustion and industrial processing, the products of the decay of plant and animal life, the liquid droplets and ice crystals that make up clouds. Particles alter the radiation flow in the atmosphere by the processes of scattering and absorption. Particles differ by size and composition, factors which determine optical properties.

Prior to Dr. Reck's work, models for calculating the vertical temperature profile included layers of clouds and the significant gases—O_2, O_3, H_2O and CO_2—but neglected the particle factor. To establish the thermal effect of particles, later models assumed a uniform vertical temperature change.

Dr. Reck's contribution was to add the particle factor to a one-dimensional model developed at the Geophysical Fluid Dynamics Laboratory at Princeton University. This model divides the atmosphere into nine layers. An initial temperature distribution is assumed, and the model is used to compute the net radiative energy



Radiation scattering exhibited by a layer of particles. The inset shows the distribution of scattering by a single particle of mean size.

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flow into or out of each layer. A particle population is input for each layer. Calculated radiation imbalances result in a temperature change for each layer within the model, subject to the condition that change in temperature with altitude not exceed the adiabatic lapse rate. The new temperatures are used to compute a new radiation balance. This process is repeated until there are no further changes in temperature.

The particles of interest, known as Mie-scattering aerosols, are comparable in size to the wavelength of the incident radiation. Dr. Reck models the interaction of these particles with the radiation field in terms of two parameters: the single scattering albedo of the particle, which describes backscatter, and an anisotropic scattering factor, which measures the degree of forward scatter. From these two quantities and the size distribution and abundance of the particles, the transmission, absorption and backscatter of each layer in the model can be calculated.

DR. RECK discovered that whether particles have a heating or cooling influence depends upon the surface albedo, or reflective power, of the earth directly beneath them. Snow (0.6) is more reflective than sand (0.3); water is less reflective than either (0.07). Her results indicate that when surface albedo is small, the net effect of particles is to "shield" the earth from incoming solar radiation, producing a cooling influence. When surface albedo is large, a trapping effect prevails, in which the portion of solar radiation that reaches the earth's surface is "trapped" between the surface and the particles, producing a net heating influence. The competition between these two effects, shielding and trapping, determines the overall thermal influence of particles.

Dr. Reck calculated that for the latitudes between the equator and 35°N, where average surface albedo is low, the current background level of atmospheric particles decreases solar radiation reaching the earth by ~1%, thus producing a net cooling effect. Her findings indicate that heating takes place at latitudes north of 55°N, where average surface albedo is high. Calculations with the model indicate a correlation between the increase in particle abundance due to volcanic activity in 1970 and a subsequent ice build-up in 1971.

"Previous models did not adequately take into account the role played by particles in the earth's thermal balance," says Dr. Reck. "The geosystem is continually changing. It is important for us to understand the elements that affect this evolution, so that we may know how man's activities influence the atmosphere."

THE WOMAN BEHIND THE WORK

Dr. Ruth Reck is a Staff Research Scientist in the Physics Department at the General Motors Research Laboratories.

Dr. Reck received her Ph.D in physical chemistry from the University of Minnesota. Her thesis, on the statistical mechanics of heterogeneous systems, concerned the theory of diffusion-controlled chemical reactions. Prior to joining General Motors in 1965, she was a Research Associate in the Applied Mathematics Department of Brown University.

In addition to global climate studies, Dr. Reck has done research at General Motors in solid state physics and magnetic materials. Over the last seven years, she has participated in several international exchange programs on climate-related subjects.

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PYGMALION

BY JOHN UPDIKE

WHAT HE LIKED ABOUT HIS FIRST WIFE WAS HER gift of mimicry; after a party, theirs or another couple's, she would vivify for him what they had seen, the faces, the voices, twisting her pretty mouth into small contortions that brought back, for a dazzling instant, the presence of an absent acquaintance. "Well, if I reawy—how does Gwen talk?—if I *re*-awwy cared about conserwation—" And he, the husband, would laugh and laugh, even though Gwen was secretly his mistress and would become his second wife. What he liked about *her* was her liveliness in bed, and what he disliked about his first wife was the way she would ask to have her back rubbed and then, under his laboring hands, night after night, fall asleep.

For the first years of the new marriage, after he and Gwen had returned from a party he would wait, unconsciously, for the imitations, the recapitulation, to begin. He would even prompt: "What did you make of our hostess's brother?"

"Oh," Gwen would simply say, "he seemed very pleasant." Sensing with feminine intuition that he expected more, she might add, "Harmless. Maybe a little stuffy." Her eyes flashed as she heard in his expectant silence an unvoiced demand, and with that touching, childlike impediment of hers she blurted out, "What are you reawy after?"

"Oh, nothing. Nothing. It's just—Marguerite met him once a few years ago and she was struck by what a pompous nitwit he was. That way he has of sucking his pipestem and ending every statement with 'Do you follow me?' "

"I thought he was perfectly pleasant," Gwen said frostily, and turned her back to remove her silvery, snug party dress. As she wriggled it down over her hips she turned her head and defiantly added, "He had a *lot* to say about tax shelters."

"I bet he did," Pygmalion scoffed feebly, numbed by the sight of his wife frontally advancing, nude, toward him and their marital bed. "It's awfully late," he warned her.

"Oh, come on," she said, the lights out.

The first imitation Gwen did was of Marguerite's second husband, Ed; they had all unexpectedly met at a Save the Whales benefit ball, to which invitations had been sent out indiscriminately. "Oh-ho-*ho*," she boomed in the privacy of their bedroom afterward, "so you're my noble predecessor!" In aside she added, "Noble, my ass. He hates you so much you turned him on."

"I did?" he said. "I thought he was perfectly pleasant, in what could have been an awkward encounter."

"Yes, in*deed*y," she agreed, imitating hearty Ed, and for a dazzling second allowing the man's slightly glassy and slack expression of forced benignity to invade her own usually petite and rounded features. "Nothing awkward about *us*, ho ho," she went on, encouraged. "And tell me, old chap, why *is* it your child-support check is never on time anymore?"

He laughed and laughed, entranced to see his bride arrive at what he conceived to be proper womanliness—a plastic, alert sensitivity to the human environment, a susceptible responsiveness tugged this way and that by the currents of Nature herself. He could not know the world, was his fear, unless a woman translated it for him. Now, when they returned from a gathering, and he asked what she had made of so-and-so, Gwen would stand in her underwear and consider, as if onstage. "We-hell, my dear," she would announce in sudden, fluting parody, "if it wasn't for Portugal there *rally* wouldn't be a country left in Europe!"

"Oh, come on," he would protest, delighted to see her pretty features distort themselves into an uncanny, snobbish horsiness.

"How did she do it?" Gwen would ask, as if professionally intent. "Something with the chin, sort of rolling it from side to side without unclenching the teeth."

"You've got it!" he applauded.

"Of course you *knoaow*," she went on in the assumed voice, "there *used* to be Greece, but now all these dreadful *Ar*abs . . ."

"Oh, yes, yes," he said, his face smarting from laughing so hard, so proudly. She had become perfect for him.

In bed she pointed out, "It's awfully late."

"Want a back rub?"

"Mmmm. That would be reawy nice." As his left hand labored on the smooth, warm, pliable surface, his wife—that small something in her that was all her own—sank out of reach; night after night, she fell asleep. □

John Updike's most recent book was Problems and Other Stories. *His new novel,* Rabbit Is Rich, *will be published this fall by Knopf.*

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An Islamic Journey

AMONG THE BELIEVERS

IRAN

BY V. S. NAIPAUL

SADEQ WAS TO GO WITH ME FROM TEHRAN TO THE HOLY city of Qom, a hundred miles to the south. I hadn't met Sadeq; everything had been arranged on the telephone. I needed an Iranian interpreter, and Sadeq's name had been given to me by someone from an embassy.

Sadeq was free because, like many Iranians since the revolution, he had found himself out of a job. He had a car. When we spoke on the telephone he said it would be better for us to drive to Qom in his car; Iranian buses were dreadful and could be driven at frightening speeds by people who didn't really care.

We fixed a price for his car, his driving, his interpretation; and what he asked for was reasonable. He said we should start as soon as possible the next morning, to avoid the heat of the August day. He would take his wife to her office—she still had a job—and come straight on to the hotel. I should be ready at 7:30.

He came some minutes before eight. He was in his late twenties, small and carefully dressed, handsome, with a well-barbered head of hair. I didn't like him. I saw him as a man of simple origins, simply educated, but with a great sneering pride, deferential but resentful, not liking himself for what he was doing. He was the kind of man who, without political doctrine, with only resentments, had made the Iranian revolution. It would have been interesting to talk to him for an hour or two; it was going to be hard to be with him for some days, as I had now engaged myself to be.

He was smiling, but he had bad news for me. He didn't think his car could make it to Qom.

I didn't believe him. I thought he had simply changed his mind.

I said, "The car was your idea. I wanted to go by the bus. What happened between last night and now?"

"The car broke down."

"Why didn't you telephone me before you left home? If you had telephoned, we could have caught the eight o'clock bus. Now we've missed that."

"The car broke down after I took my wife to work. Do you really want to go to Qom today?"

"What's wrong with the car?"

"If you really want to go to Qom we can take a chance with it. Once it starts it's all right. The trouble is to get it started."

We went to look at the car. It was suspiciously well parked at the side of the road not far from the hotel gate. Sadeq sat in the driver's seat. He called out to a passing man, one of the many idle workmen of Tehran, and the man and I began to push. A young man with a briefcase, possibly an office worker on his way to work, came and helped without being asked. The road was dug-up and dusty; the car was very dusty. It was hot; the exhausts of passing cars and trucks made it hotter. We pushed now with the flow of the traffic, now against it; and all the time Sadeq sat serenely at the steering wheel.

People from the pavement came and helped for a little, then went about their business. It occurred to me that I should also be going about mine. This—pushing Sadeq's car back and forth—wasn't the way to get to Qom; what had begun so unpromisingly wasn't going to end well. So, without telling anybody anything then or afterward, I left Sadeq and his car and his volunteer pushers and walked back to the hotel.

I TELEPHONED BEHZAD. BEHZAD HAD ALSO BEEN RECOMmended to me as an interpreter. But there had been some trouble in finding him—he was a student footloose in the great city of Tehran; and when the previous evening he had telephoned me, I had already closed with Sadeq. I told Behzad now that my plans had fallen through. He made no difficulties—and I liked him for that. He said he was still free, and would be with me in an hour.

He didn't think we should take a car to Qom. The bus was cheaper, and I would see more of the Iranian people. He also said that I should eat something substantial

Mr. Naipaul, who has been described by Elizabeth Hardwick in the New York Times *as "one of the handful of living writers of whom the English language can be proud," is the author of several novels and books of reportage. His most recent novels are* Guerrillas *and* A Bend in the River.

ILLUSTRATIONS BY TOM LULEVITCH

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before leaving. It was Ramadan, the month when Moslems fast from sunrise to sunset; and in Qom, the city of mullahs and ayatollahs, it wasn't going to be possible to eat or drink. In some parts of the country—with the general Islamic excitement—people had been whipped for breaking the fast.

Behzad's approach, even on the telephone, was different from Sadeq's. Sadeq, a small man on the rise, and perhaps only a step or two above being a peasant, had tried to suggest that he was above the general Iranian level. But he wasn't, really; there was a lot of the Iranian hysteria and confusion locked up in his smiling eyes. Behzad, explaining his country, claiming it all, managed to sound more objective.

When, at the time he had said, we met in the lobby of the hotel, I at once felt at ease with him. He was younger, taller, darker than Sadeq. He was more educated; there was nothing of the dandy about him, nothing of Sadeq's nervousness and raw pride.

We went by line taxi—a city taxi operating along fixed routes—to the bus station in south Tehran. North Tehran—spreading up into the brown hills, hills that faded in the daytime haze—was the elegant part of the city; that was where the parks and gardens were, the plane-lined boulevards, the expensive apartment blocks, the hotels and the restaurants. South Tehran was still an Eastern city, more populous and cramped, more bazaar-like, full of people who had moved in from the countryside; and the crowd in the dusty, littered yard of the bus station was like a country crowd.

Somebody in a grimy little office told Behzad that there was a bus for Qom in half an hour. The bus in question was parked in the hot sun and empty. No bags or bundles on the roof, no patient peasants waiting outside or stewing inside. That bus looked parked for the day. I didn't believe it was going to leave in half an hour; neither did Behzad. There was another bus service from Tehran, though, one that offered air-conditioned buses and reserved seats. Behzad looked for a telephone, found coins, telephoned, got no reply. The August heat had built up; the air was full of dust.

A line taxi took us to the other terminal, which was in central Tehran. Boards above a long counter gave the names of remote Iranian towns; there was even a daily service, through Turkey, to Europe. But the morning bus to Qom had gone; there wouldn't be another for many hours. It was now near noon. There was nothing for us to do but to go back to the hotel and think again.

We walked; the line taxis had no room. The traffic was heavy. Tehran, since the revolution, couldn't be said to be a city at work; but people had cars, and the idle city—so many projects abandoned, so many unmoving cranes on the tops of unfinished buildings—could give an impression of desperate busyness.

The desperation was suggested by the way the Iranians drove. They drove like people to whom the motorcar was new. They drove as they walked; and a stream of Tehran traffic, jumpy with individual stops and swerves, with no clear lanes, was like a jostling pavement crowd. This manner of driving didn't go with any special Tehran luck. The door or fender of every other car was bashed in, or bashed in and mended. An item in a local paper (blaming the Shah for not having given the city a more modern road system) had said that traffic accidents were the greatest single cause of deaths in Tehran; two thousand people were killed or injured every month.

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We came to an intersection. And there I lost Behzad. I was waiting for the traffic to stop. But Behzad didn't wait with me. He simply began to cross, dealing with each approaching car in turn, now stopping, now hurrying, now altering the angle of his path, and, like a man crossing a forest gorge by a slender fallen tree trunk, never looking back. He did so only when he got to the other side. He waved me over, but I couldn't move. Traffic lights had failed higher up, and the cars didn't stop.

He understood my helplessness. He came back through the traffic to me, and then—like a moorhen leading its chick across the swift current of a stream—he led me through dangers that at every moment seemed about to sweep me away. He led me by the hand; and, just as the moorhen places herself a little downstream from the chick, breaking the force of the current, which would otherwise sweep the little thing away forever, so Behzad kept me in his lee, walking a little ahead of me and a little to one side, so that he would have been hit first.

And when we were across the road he said, "You must always give your hand to me."

It was, in effect, what I had already begun to do. Without Behzad, without the access to the language that he gave me, I had been like a half-blind man in Tehran. And it had been especially frustrating to be without the language in these streets, scrawled and counter-scrawled with aerosol slogans in many colors in the flowing Persian script, and plastered with revolutionary posters and cartoons with an emphasis on blood. Now, with Behzad, the walls spoke; many other things took on meaning; and the city changed.

Behzad had at first seemed neutral in his comments, and I had thought that this was part of his correctness, his wish not to go beyond his function as a translator. But Behzad was neutral because he was confused. He was a revolutionary and he welcomed the overthrow of the Shah; but the religious revolution that had come to Iran was not the revolution that Behzad wanted. Behzad was without religious faith.

How had that happened? How, in a country like Iran, and growing up in a provincial town, had he learned to do without religion? It was simple, Behzad said. He hadn't been instructed in the faith by his parents; he hadn't been sent to the mosque. Islam was a complicated religion. It wasn't philosophical or speculative. It was a revealed religion, with a Prophet and a complete set of rules. To believe, it was necessary to know a lot about the Arabian origins of the religion, and to take this knowledge to heart.

Islam in Iran was even more complicated. It was a divergence from the main belief; and this divergence had its roots in the political-racial dispute about the succession to the Prophet, who died in 632 A.D. Islam, almost from the start, had been an imperialism as well as a religion, with an early history remarkably like a speeded-up version of the history of Rome, developing from city state to peninsular overlord to empire, with corresponding stresses at every stage. The Iranian divergence had become doctrinal, and there had been divergences within the divergence. Iranians recognized a special line of succession to the Prophet. But a group loyal to the fourth man in this Iranian line, the fourth Imam, had hived off; another group had their own ideas about the seventh. Only one Imam, the eighth (poisoned, like the fourth), was buried in Iran; and his tomb, in Mashhad, not far from the Russian border, was an object of pilgrimage.

"A lot of those people were killed or poisoned," Behzad said, as though explaining his lack of belief.

Islam in Iran, Shia Islam, was an intricate business. To keep alive ancient animosities, to hold on to the idea of personal revenge even after a thousand years, to have a special list of heroes and martyrs and villains, it was necessary to be instructed. And Behzad hadn't been instructed; he had simply stayed away. He had, if anything, been instructed in disbelief by his father, who was a communist. It was of the poor rather than of the saints that Behzad's father had spoken. The memory that Behzad preserved with special piety was of the first day his father had spoken to him about poverty—his own poverty, and the poverty of others.

ON THE PAVEMENT OUTSIDE THE TURKISH EMBASSY two turbanned, sunburned medicine men sat with their display of different-colored powders, roots, and minerals. I had seen other medicine men in Tehran and had thought of them as Iranian equivalents of the

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homeopathic medicine men of India. But the names these Iranians were invoking as medical authorities—as Behzad told me, after listening to their sales talk to a peasant group—were Avicenna, Galen, and "Hippocrat."

Avicenna! To me only a name, someone from the European Middle Ages: it had never occurred to me that he was a Persian. In this dusty pavement medical stock was a reminder of the Arab glory of a thousand years before, when the Arab faith mingled with Persia, India, and the remnant of the classical world it had overrun, and Moslem civilization was the central civilization of the West.

Behzad was less awed than I was. He didn't care for that Moslem past; and he didn't believe in pavement medicines. He didn't care for the Shah's architecture, either: the antique Persian motifs of the Central Bank of Iran, and the Aryan, pre-Islamic past that it proclaimed. To Behzad that stress on the antiquity of Persia and the antiquity of the monarchy was only part of the Shah's vainglory.

He looked at the bank, at the bronze and the marble, and said without passion, "That means nothing to me."

We turned once more, as we walked, to the revolution. There were two posters I had seen in many parts of the city. They were of the same size, done in the same style, and clearly made a pair. One showed a small peasant group working in a field, using a barrow or a plough—it wasn't clear which, from the drawing. The other showed, in silhouette, a crowd raising rifles and machine guns as if in salute. They were like the posters of a people's revolution: an awakened, victorious people, a new dignity of labor. But what was the Persian legend at the top?

Behzad translated: "'Twelfth Imam, we are waiting for you.'"

"What does that mean?"

"It means they are waiting for the Twelfth Imam."

The Twelfth Imam was the last of the Iranian line of succession to the Prophet. That line had ended over eleven hundred years ago. But the Twelfth Imam hadn't died; he survived somewhere, waiting to return to earth. And his people were waiting for him; the Iranian revolution was an offering to him.

Behzad couldn't help me more; he couldn't help me understand that ecstasy. He could only lay out the facts. Behzad was without belief, but he was surrounded by belief and he could understand its emotional charge. For him it was enough to say—as he did say, without satirical intention—that the Twelfth Imam was the Twelfth Imam.

Later on my Islamic journey, as difficult facts of history and genealogy became more familiar, became more than facts, became readily comprehended articles of faith, I was to begin to understand a little of Moslem passion. But when Behzad translated the legend of those revolutionary posters for me I was at a loss.

It wasn't of this hidden messiah that Iranians had written on the walls of London and other foreign cities

before the revolution. They had written—in English—about democracy; about torture by the Shah's secret police; about the "fascism" of the Shah. "*Down with fascist Shah*": that was the slogan that recurred.

I hadn't followed Iranian affairs closely; but it seemed to me, going only by the graffiti of Iranians abroad, that religion had come late to Iranian protest. It was only when the revolution had started that I understood that it had a religious leader, who had been in exile for many years. The Ayatollah Khomeini, I felt, had been revealed slowly. As the revolution developed, his sanctity and authority appeared to grow and at the end were seen to have been absolute all along.

Fully disclosed, the Ayatollah had turned out to be nothing less than the interpreter, for Iranians, of God's will. By his emergence he annulled, or made trivial, all previous protests about the "fascism" of the Shah. And he accepted his role.

And it was as the interpreter of God's will, the final judge of what was Islamic and what was not Islamic, that Khomeini ruled Iran. Some days after I arrived in Tehran, this was what he said on the radio: "I must tell you that during the previous dictatorial regime strikes and sit-ins pleased God. But now, when the government is a Moslem and a national one, the enemy is busy plotting against us. And therefore staging strikes and sit-ins is religiously forbidden because they are against the principles of Islam."

This was familiar to me, and intellectually manageable, even after a few days in Tehran: the special authority of the man who ruled both as political head and as

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voice of God. But the idea of the revolution as something more, as an offering to the Twelfth Imam, the man who had vanished in 873 A.D. and remained "in occultation," was harder to seize. And the mimicry of the revolutionary motifs of the late twentieth century—the posters that appeared to celebrate peasants and urban guerrillas, the Che Guevara outfits of the Revolutionary Guards—made it more unsettling.

Behzad translated; the walls spoke; Tehran felt strange. And North Tehran—an expensive piece of Europe expensively set down in the sand and rock of the hills, the creation of the Shah and the large middle class that had been brought into being by the uncreated wealth of oil—felt like a fantasy. There were skyscrapers, international hotels, shops displaying expensive goods with international brand names; but this great city had been grafted onto South Tehran. South Tehran was the community out of which the North had too quickly evolved. And South Tehran, obedient to the will of God and the Twelfth Imam, had laid it low.

MOSLEMS WERE PART OF THE SMALL INDIAN COMMUnity of Trinidad, which was the community into which I was born; and it could be said that I had known Moslems all my life. But I knew little of their religion. My own background was Hindu, and I grew up with the knowledge that Moslems, though ancestrally of India and therefore like ourselves in many ways, were different. I was never instructed in the religious details, and perhaps no one in my family really knew. The difference between Hindus and Moslems was more a matter of group feeling, and mysterious: the animosities our Hindu and Moslem grandfathers had brought from India had softened into a kind of folk wisdom about the unreliability and treachery of the other side.

I was without religious faith myself. I barely understood the rituals and ceremonies I grew up with. In Trinidad, with its many races, my Hinduism was really an attachment to my family and its ways, an attachment to my own difference; and I imagined that among Moslems and others there were similar attachments and privacies.

What I knew about Islam was what was known to everyone on the outside. They had a Prophet and a Book; they believed in one God and disliked images; they had an idea of heaven and hell—always a difficult idea for me. Islam, going by what I saw of it from the outside, was less metaphysical and more direct than Hinduism. In this religion of fear and reward, oddly compounded with war and worldly grief, there was much that reminded me of Christianity—more visible and "official" in Trinidad; and it was possible for me to feel that I knew about it. Its doctrine, or what I thought was its doctrine, didn't attract me. It didn't seem worth inquiring into; and over the years, in spite of travel, I had added little to the knowledge gathered in my Trinidad childhood. The glories of this religion were in the remote past; it had generated nothing like a Renaissance. Moslem countries, where not colonized, were despotisms; and nearly all, before oil, were poor.

The idea of traveling to certain Moslem countries had come to me the previous winter, during the Iranian revolution. I was in Connecticut, and on some evenings I watched the television news. As interesting to me as the events in Iran were the Iranians in the United States who were interviewed on some of the programs.

There was a man in a tweed jacket who spoke the pure language of Marxism, but was more complicated than his language suggested. He was a bit of a dandy, and proud of his ability to handle the jargon he had picked up; he was like a man displaying an idiomatic command of a foreign language. He was proud of his Iranian revolution—it gave him glamour. But at the same time he understood that the religious side of the revolution would appear less than glamorous to his audience; and so he was trying—with the help of his tweed jacket, his idiomatic language, his manner—to present himself as sophisticated as any man who watched, and sophisticated in the same way.

Another evening, on another program, an Iranian woman came on with her head covered to tell us that Islam protected women and gave them dignity. Fourteen hundred years ago in Arabia, she said, girl children were buried alive; it was Islam that put a stop to that. Well, we didn't all live in Arabia (not even the woman with the covered head); and many things had happened since the sixth century. Did women—especially someone as fierce as the woman addressing us—still need the special protection that Islam gave them? Did they need the veil? Did they need to be banned from public life and from appearing on television?

These were the questions that occurred to me. But the interviewer, who asked people prepared questions every day, didn't dally. He passed on to his next question, which was about the kind of Islamic state that the woman wanted to see in Iran. Was it something like Saudi Arabia she had in mind? Fierce enough already, she flared up at that; and with her *chador*-encircled face she looked like an angry nun, full of reprimand. It was a mistake many people made, she said; but Saudi Arabia was *not* an Islamic state. And it seemed that she was saying that Saudi Arabia was an acknowledged barbarism, and that the Islamic state of Iran was going to be quite different. (It was only in Iran that I understood the point the woman with the *chador* had made about Saudi Arabia. It was a sectarian point and might have been thought too involved for a television audience: the Arabians and the Persians belong to different sects, have different lines of succession to the Prophet, and there is historical bad blood between them.)

It was of the beauty of Islamic law that I heard a third

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Iranian speak. But what was he doing studying law in an American university? What had attracted these Iranians to the United States and the civilization it represented? Couldn't they say? The attraction existed; it was more than a need for education and skills. But the attraction wasn't admitted; and in that attraction, too humiliating for an old and proud people to admit, there lay disturbance—expressed in dandyism, mimicry, boasting, and rejection.

An American or non-Islamic education had given the woman with the *chador* her competence and authority. Now she appeared to be questioning the value of the kind of person she had become; she was denying some of her own gifts. All these Iranians on American television were conscious of their American audience, and they gave the impression of saying less than they meant. Perhaps they had no means of saying all that they felt; perhaps there were certain things they preferred not to say.

IN AUGUST OF 1979, SIX MONTHS AFTER THE OVERTHROW of the Shah, the news from Iran was still of executions. The official Iranian news agency kept count, and regularly gave a new grand total. The most recent executions had been of prostitutes and brothel-managers; the Islamic revolution had taken that wicked turn. The Ayatollah Khomeini was reported to have outlawed music. And Islamic rules about women were being enforced again. Mixed bathing had been banned; Revolutionary Guards watched the beaches at the Caspian Sea resorts and separated the sexes.

In London the man at the travel agency told me that Iran was a country people were leaving. Nobody was going in; I would have the plane to myself. It wasn't so. The Iran Air flight that day had been canceled, and there was a crowd for the British Airways plane to Tehran.

Most of the passengers—the international mishmash of the airport concourse sifting and sifting itself, through gates and channels, into more or less ethnic flight pens—were Iranians; and they didn't look like people running away from an Islamic revolution or going back to one. There wasn't a veil or a head-cover among the women, one or two of whom were quite stylish. They had all done a lot of shopping, and carried the variously designed plastic bags of London stores—Lillywhites, Marks & Spencer, Austin Reed.

We made a technical stop at Kuwait, to refuel; no one left the plane. It was dark, but dawn was not far off. The light began to come; the night vanished. And we saw that the airport—such a pattern of electric lights from above—had been built on sand. The air that came through the ventilators was warm. It was 40 degrees centigrade outside, 104 Fahrenheit, and the true day had not begun.

Tehran was going to be cooler, the steward said. It was an hour's flight to the northeast: more desert, oblongs of pale vegetation here and there, and here and there gathers of rippled earth that sometimes rose to mountains.

After all that I had heard about the Shah's big ideas for his country, the airport building at Tehran was a disappointment. The arrival hall was like a big shed. Blank rectangular patches edged with reddish dust—ghost pictures in ghostly frames—showed where, no doubt, there had been photographs of the Shah and his family or his monuments. Revolutionary leaflets and caricatures were taped down on walls and pillars; and—also taped down: sticky paper and handwritten notices giving a curious informality to great events—there were colored photographs of the Ayatollah Khomeini, as hard-eyed and sensual and unreliable and roguish-looking as any enemy might have portrayed him.

The airport branch of the Melli Bank—rough tables, three clerks, a lot of paper, a littered floor—was like an Indian bazaar stall. A handwritten notice on the counter said: *Dear Guests. God is the Greatest. Welcome to the Islamic Republic of Iran.* Bits of sticky brown paper dotted the customs notice boards that advised passengers of their allowances. The brown paper did away with the liquor allowance; it was part of the Islamic welcome.

The luggage track that should have been rolling out our luggage didn't move for a long time. And the Iranian passengers, with their London shopping bags, seemed to become different people. At Heathrow they had been Iranians, people from the fairyland of oil and money, spenders; now, in the shabby arrival hall, patient in their own setting and among their own kind, they looked like country folk who had gone to town.

The customs man had a little black brush moustache. He asked, "Whiskey?" His pronunciation of the word, and his smile, seemed to turn the query into a joke. When I said no he took my word and smilingly waved me out into the summer brightness, to face the post-revolutionary rapaciousness of the airport taximen, who after six months were more than ever animated by memories of the old days, when the world's salesmen came to Tehran, there were never enough hotel rooms, and no driver pined for a fare.

The colors of the city were as dusty and pale as they had appeared from the air. Dust blew about the road, coated the trees, dimmed the colors of cars. Bricks and plaster were the color of dust; unfinished buildings looked abandoned and crumbling; and walls, like abstracts of the time, were scribbled over in the Persian script and stenciled with portraits of Khomeini.

My hotel was in central Tehran. It was one of the older hotels of the city. It was behind a high wall; it had a gateman's lodge, an asphalted circular drive, patches of lawn with shrubs and trees. It was in better order than I had imagined; there were even a few cars. But the building the driver took me to had a chain across the glass door. Someone shouted from the other side of the compound. The building we had gone to was closed. It was the

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older building of the hotel; during the boom they had built a new block, and now it was only that block that was open.

A number of young men—the hotel taxi drivers, to whom the cars outside belonged—were sitting idly together in one corner of the lobby, near the desk. Away from that corner the lobby was empty. In the middle of the floor there was a very large patterned carpet; the chairs arranged about it appeared to await a crowd. There were glass walls on two sides. On one side was the courtyard, with the dusty shrubs and pines and the parked hotel taxis; on the other side, going up to the hotel wall, was a small paved pool area, untenanted, glaring in the light, with metal chairs stacked up below an open shed.

The room to which I was taken up was of a good size, with sturdy wooden furniture, and with wood paneling three or four feet up the side walls. The glass wall at the end faced North Tehran; a glass door opened on to a balcony. But the air-conditioning duct was leaking through its exhaust grille, and the blue carpet tiling in the vestibule was sodden and stained.

The hotel man—it was hard, in the idleness of the hotel, to attach the professional status of "boy" to him, though he wore the uniform—smiled and pointed to the floor above and said, "Bathroom," as though explanation were all that was required. The man he sent up spoke about condensation; he made the drips seem normal, even necessary. And then—explanations abruptly abandoned—I was given another room.

It was furnished like the first and had the same view. On the television set here, though, there was a white card, folded down the middle and standing upright. It gave the week's programs on the "international," English-language service of Iranian television. The service had long been suspended. The card was six months old.

It was not only Ramadan, the Moslem fasting month; it was Friday, the sabbath; and it was an election day. Tehran was unusually quiet, but I didn't know that; and when in the afternoon I went walking I felt I was in a city where a calamity had occurred. The shops in the main streets were closed and protected by steel gates. Signs on every floor shrieked the names of imported things: Seiko, Citizen, Rolex, Mary Quant of Chelsea, Aiwa; and on that closed afternoon they were like names from Tehran's past.

The pavements were broken. Many shop signs were broken or had lost some of their raised letters. Dust and grime were so general, and on illuminated signs looked so much like the effect of smoke, that buildings that had been burned out in old fires did not immediately catch the eye. Building work seemed to have been suspended; rubble heaps and gravel heaps looked old, settled.

In the pavement kiosks there were magazines of the revolution. The cover of one had a composite photograph of the Shah as a bathing beauty: the head of the Shah attached to the body of a woman in a bikini—but the bikini had been brushed over with a broad stroke of black, not to offend modesty. In another caricature the Shah, jacketed, his tie slackened, sat on a lavatory seat with his trousers down, and with a tommy gun in his hand. A suitcase beside him was labeled *To Israel* and *Bahama*; an open canvas bag showed a bottle of whiskey and a copy of *Time* magazine.

Young men in tight, open-necked shirts dawdled on the broken pavements. They were handsome men of a clear racial type, small, broad-shouldered, narrow-waisted. They were working men of peasant antecedents, and there was some little air of vanity and danger about them that afternoon: they must have been keyed up by the communal Friday prayers. In their clothes, and especially their shirts, there was that touch of flashiness that—going by what I had seen in India—I associated with people who had just emerged from traditional ways and now possessed the idea that, in clothes as in other things, they could choose for themselves.

The afternoon cars and motorcycles went by, driven in the Iranian way. I saw two collisions. One shop had changed its name. It was now "Our Fried Chicken," no longer the chicken of Kentucky, and the figure of the southern colonel had been fudged into something quite meaningless (except to those who remembered the colonel). Revolutionary Guards, young men with guns, soon ceased to be surprising; they were part of the revolutionary sabbath scene. There were crowds outside the cinemas; and, Ramadan though it was, people were buying pistachio nuts and sweets from the *confiseries*—so called—that were open.

Far to the north, at the end of a long avenue of plane trees, an avenue laid out by the Shah's father, was the

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Royal Tehran Hilton. It was "royal" no longer. The word had been taken off the main roadside sign and hacked away from the entrance; but inside the hotel the word survived like a rooted weed, popping up fresh and clean on napkins, bills, menus, crockery.

The lounge was nearly empty; the silence there, among waiters and scattered patrons, was like the silence of embarrassment. Iranian samovars were part of the decor. (There had been some foreign trade in these samovars as decorative ethnic objects; two years or so before, I had seen a number of them in the London stores, converted into lampstands.) Alcohol could no longer be served; but for the smart (and non-Christian) who needed to sip a nonalcoholic drink in style, there was Orange Blossom or Virgin Mary or Swinger.

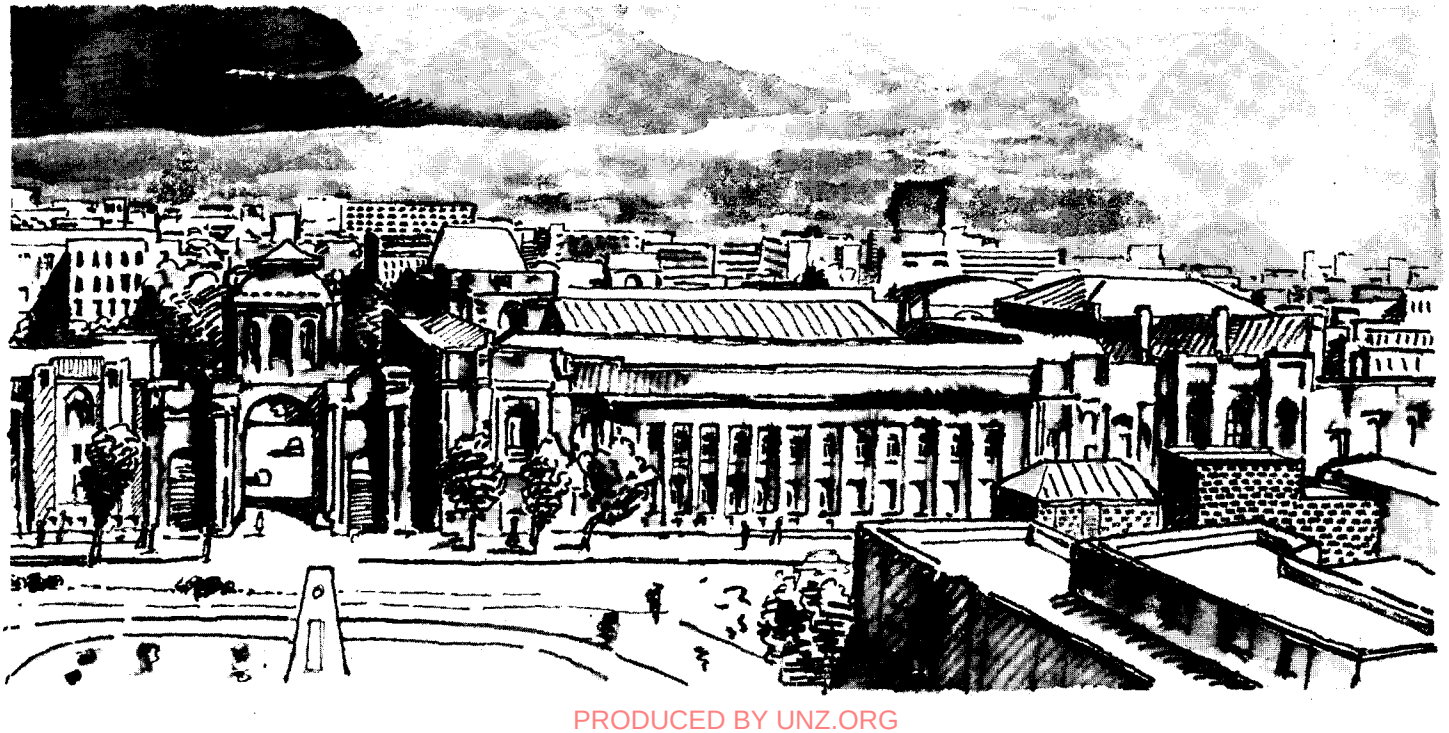
The pool at the side of the hotel was closed, for chemical cleaning, according to the notice. But the great concrete shell next door, the planned extension to the Royal Tehran Hilton, had been abandoned, with all the building materials on the site and the cranes. There were no "passengers" now, a waiter told me, and the contractors had left the country. From the Hilton you could look across to the other hills of North Tehran and see other unfinished, hollow buildings that looked just as abandoned. The revolution had caught the "international" city of North Tehran in mid-creation.

TECHNOLOGY WAS EVIL. E. F. SCHUMACHER OF *SMALL Is Beautiful* had said so: *The Message of Peace*, an English-language magazine published in the holy city of Qom, quoted him a lot, lashing the West with its own words. But technology surrounded us in Tehran, and some of it had been so Islamized or put to such good Islamic use that its foreign origin seemed of no account. The hotel taxi driver could be helped through the evening traffic jams by the Koranic readings on his car radio; and when we got back to the hotel there would be mullahs on television. Certain modern goods and tools—cars, radios, television—were necessary; their possession was part of a proper Islamic pride. But these things were considered neutral; they were not associated with any particular faith or civilization; they were thought of as the stock of some great universal bazaar.

Money alone bought these things. And money, in Iran, had become the true gift of God, the reward for virtue. Whether Tehran worked or not, $70 million went every day to the country's external accounts, to be drawn off as required: foreign currencies, secured by foreign laws and institutions, to keep the Islamic revolution going.

But some people were scratchy. They could be scratchy in empty restaurants that didn't have the food their old-time menus offered. They needed customers, but they couldn't help hating those who came. They were scratchy at my hotel, for an additional reason. After the revolution the owners had left the country. The hotel had been taken over by a revolutionary *komiteh*, and it was important for everyone downstairs to display pride. (It was different upstairs. The chambermaid told me by signs one morning that I wasn't to use the hotel laundry; she would wash my clothes. She did. When I came back in the afternoon I saw my damp clothes displayed in the corridor, hung out to dry on the doorknobs of unoccupied rooms.)

Nicholas, a young British journalist, came to see me one evening and began to quarrel with the man at the desk about the hotel taxi charges. The quarrel developed fast in the empty lobby.



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Nicholas, tall and thin and with a little beard, was jumpy from overwork: the long hours he kept as a foreign correspondent, the "disinformation" he said he had constantly to sift through, the sheer number of words he had to send back every day. He had also begun to be irritated by the events he was reporting.

The man at the desk was big and paunchy, with a sallow skin and curly black hair. He wore a suit and radiated pride. His pride, and Nicholas's rage, made him lose his head. He went back to the manners and language of old times.

He said, "If you don't like the hotel, you can leave."

Nicholas, with the formality of high temper, said, "It is my good fortune *not* to be staying at the hotel."

I took the car at the stated price, to calm them both down.

Nicholas leaned on the desk, but looked away. The man at the desk began to write out the taxi requisition slip. In spite of his appearance, he was a man from the countryside. He had spent a fair amount of money to send his mother on the pilgrimage to Mecca; he was anxious about money and the future, and worried about the education of his children. During the boom an American university education had seemed possible for the boy, but now he had to think of other ways.

Nicholas was closed to pity. He remembered the boom too, when hotels had no rooms, and he and many others had slept on camp beds in the ballroom of a grand hotel and paid five dollars a night.

He said, "For seven months no one in this country has done a stroke of work. Where else can you do that and live?"

BEHZAD AND I WENT TO QOM BY CAR. IT WAS PAST NOON when we got back to the hotel, and the hotel taxi drivers, idle though they were, didn't want to make the long desert trip. Only one man offered, and he asked for seventy dollars. Behzad said it was too much; he knew someone who would do it for less.

We waited a long time for Behzad's driver, and then we found that between our negotiations on the telephone and his arrival at the hotel his charges had gone up. He was a small, knotty man, and he said he wasn't a Moslem. He didn't mean that. He meant only that he wasn't a Shia or a Persian. He was a "tribesman," a Lur, from Luristan, in the west.

Qom had a famous shrine, the tomb of the sister of the eighth Shia Imam; for a thousand years it had been a place of pilgrimage. It also had a number of theological schools. Khomeini had taught and lectured at Qom; and on his return to Iran after the fall of the Shah he had made Qom his headquarters. He was surrounded there by ayatollahs, people of distinction in their own right, and it was one of these attendant figures, Ayatollah Khalkhalli, whom I was hoping to see.

Khomeini received and preached and blessed; Khalkhalli hanged. He was Khomeini's hanging judge. It was Khalkhalli who had conducted many of those swift Islamic trials that had ended in executions, with official before-and-after photographs: men shown before they were killed, and then shown dead, naked on the sliding mortuary slabs.

Khalkhalli had recently been giving interviews, emphasizing his activities as judge, and a story in Tehran was that he had fallen out of favor and was trying through these interviews to keep his reputation alive. He told the Tehran *Times* that he had "probably" sentenced four hundred people to death in Tehran: "On some nights, he said, bodies of 30 or more people would be sent out in trucks from the prison. He claimed he had also signed the death warrants of a large number of people in Khuzistan Province." Khuzistan was the Arab province in the southwest, where the oil was.

He told another paper that there had been a plot—worked out in the South Korean Embassy—to rescue Hoveyda, the Shah's prime minister, and other important people from the Tehran jail. As soon as he, Khalkhalli, had heard of this plot he had decided—to deal a blow to the CIA and Zionism—to bring forward the cases. "I reviewed all their cases in one night and had them face the firing squad." He told the Tehran *Times* how Hoveyda had died. The first bullet hit Hoveyda in the neck; it didn't kill him. Hoveyda was then ordered by his executioner—a priest—to hold his head up; the second bullet hit him in the head and killed him.

"Would this man see me?" I had asked an agency correspondent, when we were talking about Khalkhalli.

"He would *love* to see you."

And Behzad thought it could be arranged. Behzad said he would telephone Khalkhalli's secretary when we got to Qom.

The telephone, the secretary: the modern apparatus seemed strange. But Khalkhalli saw himself as a man of the age. "He said" (this was from the Tehran *Times*) "the religious leaders were trying to enforce the rule of the Holy Prophet Mohammed in Iran. During the days of the Prophet swords were used to fight, now they have been replaced by Phantom aircraft." Phantoms: not American, not the products of a foreign science, but as international as swords, part of the stock of the great world bazaar, and rendered Islamic by purchase.

There was a confusion of this sort in Behzad's mind as well. Behzad's father had been imprisoned during the Shah's time, and Behzad had inherited his father's dream of a "true" revolution. Such a revolution hadn't come to Iran; but Behzad, employing all the dialectic he had learned, was forcing himself to see, in the religious fervor of Khomeini's revolution, the outline of what could be said to be true. And as we drove south through Tehran—at first like a bazaar, and then increasingly like a settlement in a polluted desert—it was the

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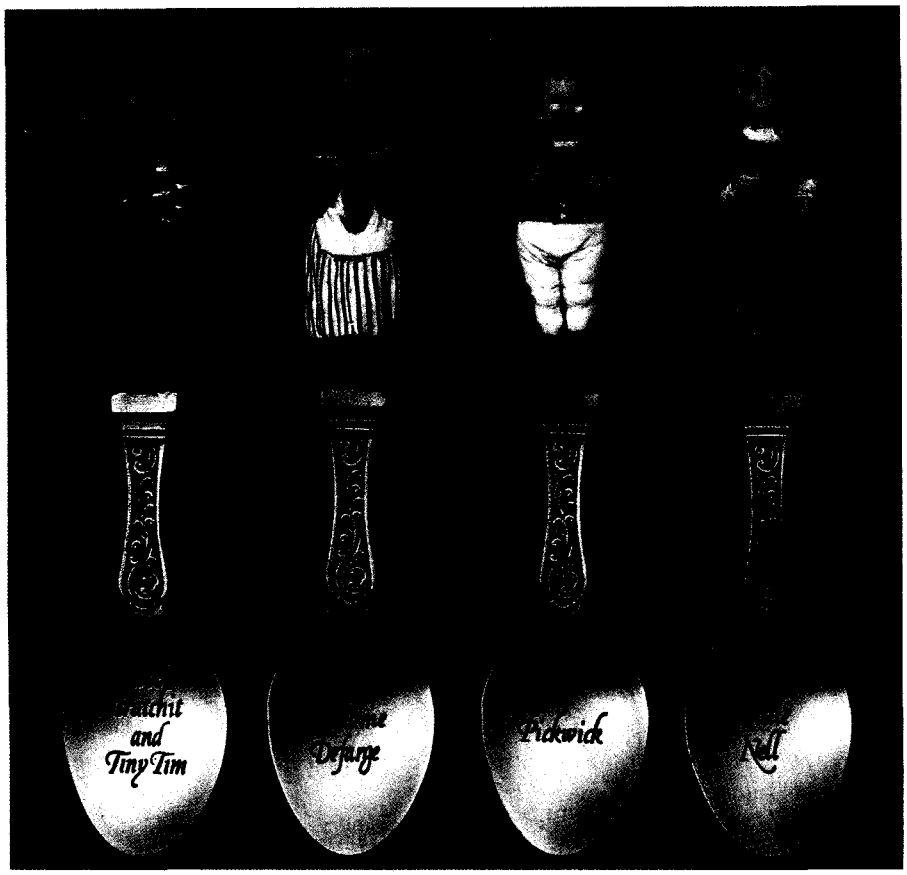
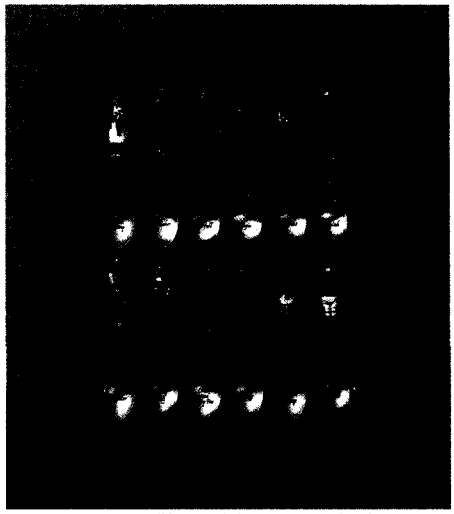
THE DICKENS HOUSE MUSEUM, LONDON, PRESENTS

The Charles Dickens Spoons



Hand-painted spoons shown smaller than actual size: approximately 5 inches long.

Enlarged to show hand-painted detail.



Hardwood spoon rack will be provided at no cost to subscribers.

Twelve unique collector's spoons portraying the most famous and beloved characters of Charles Dickens. Created by the esteemed British artist Peter Jackson–crafted in fine pewter and individually hand-painted.

To be issued in limited edition.
Subscription deadline: July 31, 1981.

FROM THE AGE OF QUEEN VICTORIA right up to the present, the characters of *Charles Dickens* have delighted families the world over. Now, The Dickens House Museum in London announces a most unusual collection, portraying the greatest characters of the world's most beloved author: 'The Charles Dickens Spoons.'

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To craft 'The Charles Dickens Spoons,' the Museum has appointed The Franklin Mint, whose pewtersmiths will *hand-engrave* the 'master' for each work . . . and *hand-finish* each sculptured pewter spoon.

Each spoon will then be *hand-painted*—using fine-tipped brushes to define such details as Scrooge's little brass candlestick . . . or the stripes of Sam Weller's waistcoat.

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The Dickens House Museum will issue the collection once only, in limited edition. It will be available solely by direct subscription, with a further limit of one collection per subscriber. The edition will be permanently closed in the United States at the end of this calendar year—1981—and the Subscription Application on this page is valid only if postmarked by July 31, 1981. To subscribe, be sure to return your application no later than July 31.

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city of proletarian revolt that he was anxious to show me.

Low brick buildings were the color of dust; walls looked unfinished; bright interiors seemed as impermanent as their paint. Tehran, in the flatland to the south, had been added and added to by people coming in from the countryside; and clusters of traditional square clay-brick houses with flat roofs were like villages.

We passed a great factory shed. Some kind of beige fur had adhered to the walls below every window. Behzad told me it was a cloth factory and had been a center of the revolution. The army had gone in, and many workers had been killed.

After the oil refinery, puffing out flame from its chimney, we were in the true desert. There were no trees now, and the views were immense: mounds, hills, little ranges. The road climbed, dipped into wide valleys. Hills and mounds were smooth, and sometimes, from a distance and from certain angles, there was the faintest tinge of green on the brown, from tufts of grass and weeds that were then seen to be really quite widely scattered.

From the top of a hill we saw, to the left, the salt lake marked on the map. It looked small and white, as though it was about to cake into salt; and the white had a fringe of pale green. Behzad said that sometimes it all looked blue. Many bodies had been dumped there by the Shah's secret police, from helicopters. And the lake was bigger than it looked. It was a desolation when we began to pass it; the green water that fringed the white was very far away. The land after that became more broken. Hills were less rounded, their outlines sharper against the sky.

It was desert, but the road was busy; and occasionally there were roadside shacks where soft drinks or melons could be had. Behzad thought we should drink or eat something before we got to Qom, because in Qom, where they were strict about the Ramadan fasting, there would be nothing to eat or drink before sunset.

We stopped at a bus-and-truck halt, with a big rough café in Mediterranean colors and a watermelon stall on a platform beside the road. The watermelon man, seated at his stall below a thin cotton awning that gave almost no shade, was sleeping on his arms.

We woke him up and bought a melon, and he lent a knife and forks. Behzad halved the melon and cut up the flesh, and we all three—the driver joining us without being asked—squatted round the melon, eating as it were from the same dish. Behzad, I could see, liked the moment of serving and sharing. It could be said that it was a Moslem moment; it was the kind of sharing Moslems practiced—and the driver had joined us as a matter of course. But the driver was a worker; Behzad was sharing food with someone of the people, and he was imposing his own ritual on this moment in the desert.

Two saplings had been planted on the platform. One was barked and dead; the other was half dead. Between them lay an old, sunburned, ill-looking woman in black, an inexplicable bit of human debris an hour away from Tehran. Scraps of newspaper from the stall blew about in the sand, and caught against the trunks of the trees. Across the road a lorry idled, its exhaust smoking; and traffic went by all the time.

We squatted in the sand and ate. The driver spat out the watermelon seeds onto the road. I did as the driver did; and Behzad—but more reverentially—did likewise. Abruptly, stabbing his fork into the melon, saying nothing, the square-headed little Lur jumped off the platform. He was finished; he had had enough of the melon. He walked across the dingy desert yard to the café to look for a lavatory, and Behzad's moment was over.

I HAD IMAGINED THAT QOM, A HOLY CITY, WOULD BE built on hills: it would be full of cliff walls and shadows and narrow lanes cut into the rock, with cells or caves where pious men meditated. It was set flat in the desert, and the approach to it was like the approach to any other desert town: shacks, gas stations. The road grew neater; shacks gave way to houses. A garden bloomed on a traffic roundabout—Persian gardens have this abrupt, enclosed, oasis-like quality. A dome gleamed in the distance between minarets. It was the dome of the famous shrine.

Behzad said, "That dome is made of gold."

It had been gilded in the last century. But the city we began to enter had been enriched by oil; and it seemed like a reconstructed bazaar city, characterless except for the gold dome and its minarets.

Behzad said, "How shall I introduce you? Correspondent? Khalkhalli likes correspondents."

"That isn't how I want to talk to him, though. I really just want to chat with him. I want to understand how he became what he is."

"I'll say you are a writer. Where shall I say you come from?"

That was a problem. England would be truest, but would be misleading. Trinidad would be mystifying, and equally misleading. South America was a possibility, but the associations were wrong.

"Can you say I am from the Americas? Would that make sense in Persian?"

Behzad said, "I will say that you come from America, but you are not an American."

We made for the dome and stopped in a parking area outside the shrine. It was midafternoon, and it was hotter in the town than in the desert; the gilded dome looked hot. The Lur driver, in spite of our sacramental watermelon feast, was mumbling about food. Ramadan or not, he wanted to take the car and go out of Qom to look for something to eat; and he wanted to know what our plans were.

Across the road, near a watermelon stall at the gateway to the shrine, there was a glass-walled telephone

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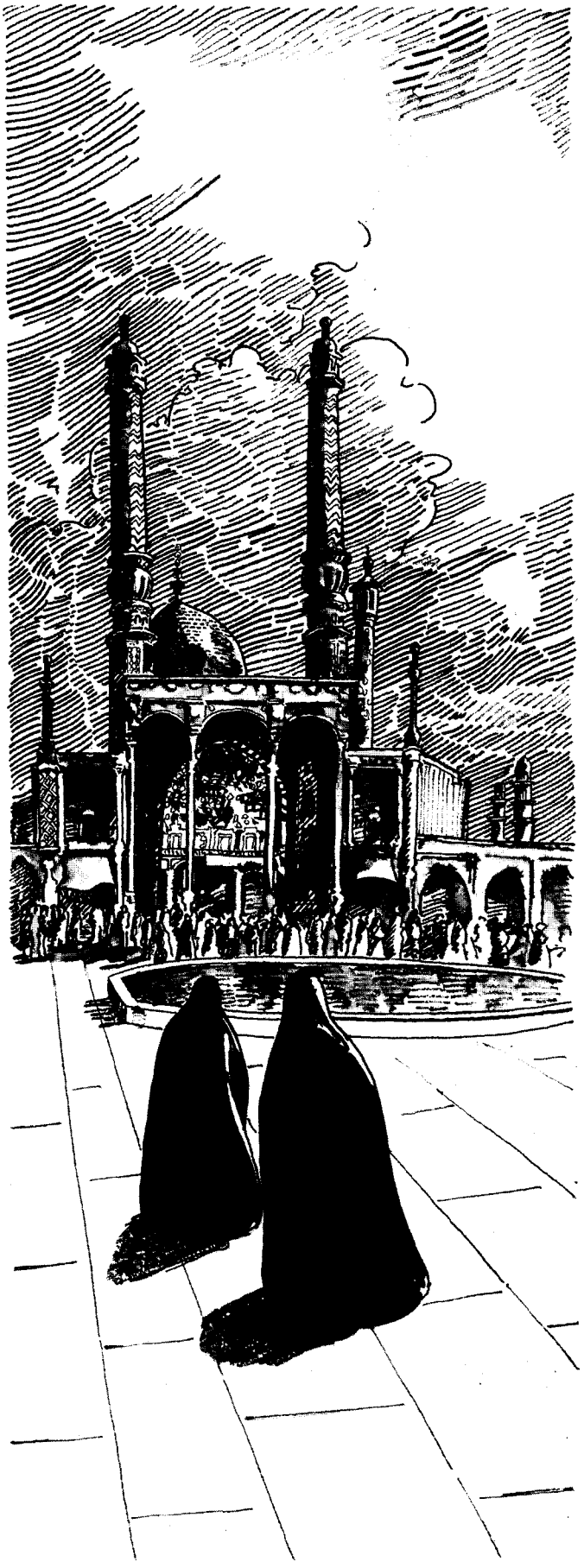

booth of German design. Behzad went to telephone Khalkhalli's secretary.

The high wall of the shrine area was sprayed and painted with slogans in Persian. There were two in English—*WE WANT REPUBLIC, KHOMEINI IS OUR LEADER*—and they must have been meant for the foreign television cameras. The second slogan was a direct translation of *Khomeini e Imam*, but as a translation it was incomplete, suggesting only (with the help of the first slogan) a transfer of loyalty from the Shah to Khomeini, not stating the divine authority of the leader or the access to heaven that he gave. In Iran, where for eleven hundred years they had been waiting for the return of the Twelfth Imam, *Imam* was a loaded word; and especially here at Qom, where the sister of the Eighth Imam was buried. Access to heaven, rejection of nondivine rule, was the purpose of the "republic" proclaimed here.

Behzad, opening the door of the telephone booth, the telephone in his hand, waved me over.

When I went to him he said, "The secretary says that Khalkhalli is praying. He will see you at nine this evening, after he has broken his fast."

It was 3:30. We had told the driver we would be only three or four hours in Qom.

Behzad said, "What do you want me to tell the secretary?"

"Tell him we'll come."

Then we went to break the bad news to the impatient Lur—or the good news: he was charging by the hour. He said something that Behzad didn't translate. And he drove off to look for food, leaving Behzad and me to think of ways of spending five and a half hours in the torpid, baking city, where nothing could be eaten or drunk for the next five hours.

THE SHOPS OPPOSITE THE SHRINE SOLD SOUVENIRS—plates with Khomeini's face on them, cheap earthenware vases—and sweets: flat round cakes, brown, soft, very sweet-looking, breaking up at the edges. Food could be sold to travelers during Ramadan, Behzad said; but it wasn't worth the trouble. Not many people were about. A crippled old woman, a pilgrim no doubt, was wheeling herself slowly past the shops. We surprised a plump boy in a booth taking a nibble at a brown cake, part of his stock; but he judged us harmless and smiled (though a couple of people had been whipped some days before for eating).

The souvenir shops also sold little clay tablets stamped with Arabic lettering. The clay was from the Arabian cities of Mecca and Medina (good business for somebody over there); so that the faithful, bowing down in prayer and resting their foreheads on these tablets, touched sacred soil. High on the shrine wall, in glazed blue and white tiles, there was, as I supposed, a Koranic quotation.

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Behzad couldn't translate it; it was in Arabic, which he couldn't read.

Arabia! Its presence in Iran shouldn't have surprised me, but it did. Because with one corner of my mind I approached Iran through classical history and felt awe for its antiquity: the conqueror of Egypt, the rival of Greece, undefeated by Rome; and with another corner of my mind I approached it through India, where, at least in the northwest, the idea of Persia is still an idea of the highest civilization—as much as France used to be for the rest of Europe—in its language, its poetry, its carpets, its food. In Kashmir, *Farsi khanna*, Persian food, is the supreme cuisine; and of the *chenar*, the transplanted plane tree, or sycamore, of Persia (so prominent in both Persian and Indian Moghul painting) it is even said that its shade is medicinal. In Qom these ideas had to be discarded. Here they looked to spartan Arabia as to the fount.

Behzad suggested that we should visit the shrine. If anyone asked, I was to say I was a Moslem. I said I wouldn't be able to carry it off. I wouldn't know how to behave. Was it with the right foot that one entered a mosque, and with the left the lavatory? Or was it the other way round? Was it the Sunnis who, during their ablutions, let the water run down their arms to their fingers? Did the Shias, contrariwise, run the water down from their hands to their elbows? And what were the gestures of obeisance or reverence? There were too many traps. Even if I followed Behzad and did what he did, it wouldn't look convincing.

Behzad said, "You wouldn't be able to follow me. I don't know what to do either. I don't go to mosques."

But we could go into the courtyard, and to do that we didn't have to take off our shoes. The courtyard was wide and very bright. At one side was a clock tower, with an austere modern clock that had no numerals. On the other side was the entrance to the shrine. It was high and recessed and it glittered as with silver, like a silver cave, like a silver-vaulted dome cut down the middle. But what looked like silver was only glass, thousands of pieces catching light at different angles. And here at last were the pilgrims, sunburned peasants, whole families, who had come from far. They camped in the open cells along the courtyard wall (each cell the burial place of a famous or royal person), and they were of various racial types: an older Persia, a confusion of tribal and transcontinental movements.

One Mongoloid group was Turkoman, Behzad said. I hardly knew the word. In the 1824 English novel *Hajji Baba* (which I had bought at the hotel in a pirated offset of the Oxford World's Classics edition), there were Turkoman bandits. I had once, in a London saleroom, seen a seventeenth-century Indian drawing of a yoked Turkoman prisoner, his hands shackled to a block of wood at the back of his neck. So the Turkomans were men of Central Asia who were once feared. How they fitted into Persian history I didn't know; and their past of war and banditry seemed far from these depressed campers at the shrine. Small, sunburned, ragged, they were like debris at the edge of a civilization that had itself for a long time been on the edge of the world.

Near the mosque was the two-story yellow brick building where Khomeini had taught and lectured. It was neutral, nondescript; and nothing was going on there now. Behzad and I walked in the bazaar. For most of the stallkeepers it was siesta time. In one bread stall, stacked high with flat perforated rounds of sweet bread, the man was stretched out on a shelf or counter on the side wall and seemed to be using part of his stock as a pillow. Behzad bought a paper. It was very hot; there was little to see; Qom's life remained hidden. We began to look for shade, for a place to sit and wait.

We came upon a small hotel. It was cramped inside, but newly furnished. The two men seated behind the desk pretended not to see us, and we sat in the little front lounge; nobody else was there. After some minutes one of the men from the desk came and told us to leave. The hotel was closed for Ramadan; that was why, he added disarmingly, he and his friend hadn't stood up when we came in.

We went out into the light and dust, past the souvenir shops again, with the brown cakes and the tablets of Arabian clay, and were permitted to sit in the empty café opposite the *KHOMEINI IS OUR LEADER* slogan. It was a big place, roughly designed and furnished, but the pillars were faced with marble.

There was nothing to drink—a bottled cola drink seemed only full of chemical danger—and the place was warm with the raw smell of cooking mutton. But the shade was refreshing; and the relaxed exhaustion that presently came to me, while Behzad read his Persian paper, helped the minutes by.

WE WENT OUT TO TELEPHONE KHALKHALLI'S secretary again, to see whether the appointment couldn't be brought forward. It was about half past five, and a little cooler. There were more people in the street. Our driver had come back; he hadn't found anything to eat.

Behzad telephoned. Then, coming out of the telephone booth, he got into conversation with two bearded young men who were in mullah's costume. I hadn't seen them approach; I had been looking at Behzad.

I had so far seen mullahs only on television, in black and white, and mainly heads and turbans. The formality of the costume in real life was a surprise to me. It made the two men stand out in the street: black turbans, white collarless tunics, long, lapel-less, two-button gowns in pale green or pale blue, and the thin black cotton cloaks that were like the gowns of scholars and fellows at Oxford and Cambridge and St. Andrew's in Scotland.

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Here, without a doubt, was the origin of the cleric's garb of those universities, in medieval times centers of religious learning, as Qom still was.

The costume, perhaps always theatrical, a mark of quality, also gave physical dignity and stature, as I saw when Behzad brought the young men over. They were really quite small men, and younger than their beards suggested.

Behzad said, "You wanted to meet students."

We had talked about it in the car, but hadn't known how to go about it.

Behzad added, "Khalkhalli's secretary says we can come at eight."

I felt sure we could have gone at any time, and had been kept waiting only for the sake of Khalkhalli's dignity.

The two young men were from Pakistan. They wanted to know who I was, and when Behzad told them that I came from America but was not American, they seemed satisfied; and when Behzad further told them that I was anxious to learn about Islam, they were immediately friendly. They said they had some books in English in their hostel which I would find useful. We should go there first, and then we would go to the college to meet students from many countries.

Behzad arranged us in the car. He sat me next to the Lur driver, who was a little awed by the turbans and gowns and beards; Behzad himself sat with the Pakistanis. They directed the driver to an unexpectedly pleasant residential street. But they couldn't find the books they wanted to give me, and so we went on, not to the college but to an administrative building opposite the college.

And there, in the entrance, we were checked by authority: a middle-aged man, dressed like the students, but with a black woolen cap instead of a turban. He was not as easily satisfied as the students had been by Behzad's explanation. He was, in fact, full of suspicion.

"He is from America?"

Behzad and the students, all now committed to their story, said, "But he's not American."

The man in the woolen cap said, "He doesn't have to talk to students. He can talk to me. I speak English."

He too was from Pakistan. He was thin, with the pinched face of Mr. Jinnah, the founder of that state. His cheeks were sunken, his lips parched and whitish from his fast.

He said, "Here we publish books and magazines. They will give you all the information you require."

He spoke in Persian or Urdu to one of the students, and the student went off and came back with a magazine. It was *The Message of Peace*, Vol. I, no. 1.

So this was where they churned it out, the rage about the devils of the Western democracies, the hagiographies of the Shia Imams. This was where they read Schumacher and Toynbee and used their words—about technology and ecology—to lash the West.

I said to the man with the woolen cap, "But I know your magazine."

He was thrown off balance. He looked disbelieving.

"I've been reading Vol. I, no. 2. The one with the article about Islamic urban planning."

He didn't seem to understand.

"I bought it in Tehran."

Grimly, he beckoned us in. And we went up to his office after taking off our shoes. The terrazzo steps were wide, the corridors were wide; the rooms were spacious, with carpet tiling.

The man in the woolen cap, the director, as I now took him to be, sat behind his new steel desk. One of the students sat on his left. Behzad and I and the other student sat in a line on chairs against the far wall, facing the desk. And, as formally as we were seated, we began.

The student on the director's left said that Islam was the only thing that made humans human. He spoke with tenderness and conviction, and to understand what he meant it was necessary to try to understand how, for him, a world without the Prophet and revelation would be a world of chaos.

The director picked at his nose, and seemed to approve. On his desk there were rubber stamps, a new globe, a stapler, a telephone of new design. On the shelves there were box files, the *Oxford English Dictionary*, and a Persian-English dictionary.

There were 14,000 theological students in Qom, they told me. (And yet, arriving at the worst time of the day, we had found the streets empty.) The shortest period of study was six years.

"Six years!"

The director smiled at my exclamation. "Six is nothing. Fifteen, twenty, thirty years some people can study for."

What did they study in all that time? This wasn't a place of research and new learning. They were men of faith. What was there in the subject that called for so much study? Well, there was Arabic itself; there was grammar in all its branches; there was logic and rhetoric; there was jurisprudence, Islamic jurisprudence being one course of study and the principles of jurisprudence being another; there was Islamic philosophy; there were the Islamic sciences—biographies and genealogies of the Prophet and his close companions, as well as "correlations" and traditions.

I had expected something more casual, more personal: the teacher a holy man, the student a disciple. I hadn't expected this organization of learning or this hint of classical methods. I began to understand that the years of study were necessary. Faith still absolutely bounded the world here. And, as in medieval Europe, there was no end to theological scholarship.

One of the great teachers at Qom, a man who still lectured and led prayers five times a day, had produced (or produced materials for) a twenty-five-volume com-

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mentary on a well-known work about the Shia idea of the Imam. Seven of those volumes had been published. A whole corps of scholars—no doubt collating their lecture notes: the medieval method of book-transmission—were at work on the remaining eighteen. Khomeini himself, famous for his lectures on jurisprudence and Islamic philosophy, had produced eighteen volumes on various topics.

That ordered life of prayer and lecture, commentary and reinterpretation, had almost perished toward the end of the Shah's time. Khomeini had been banished; the security forces had occupied Qom; and even the Pakistani students had been harassed by the secret police.

The student sitting on the director's left said, his voice falling, "If there had been no revolution here, Islam would have been wiped out."

Both the students came from priestly families in country towns in the Punjab, and had always known that they were meant to be mullahs. They were doing only eight years in Qom. They were taking the two-year Arabic course, with logic and rhetoric (rhetoric being no more than the classical way of laying out an argument); but they weren't doing literature. History was no part of their study, but they were free to read it privately. It was for Islamic philosophy that they had come to Qom. In no other university was the subject gone into so thoroughly; and their attendance at Qom, Khomeini's place, and Marashi's, and Shariatmadari's (all great teaching ayatollahs), would make them respected among Shias when they got back to Pakistan.

The student on Behzad's left said, in Behzad's translation, "I compare this place to Berkeley or Yale."

I said to Behzad, "That's a strange thing for him to say."

Behzad said, "He didn't say Berkeley and Yale. I said it, to make it clearer to you."

I tried to find out, as we left the room, about the fees and expenses of students. But I couldn't get a straight reply; and it was Behzad who told me directly, with an indication that I was to press no further, that it was the religious foundation at Qom that paid for the students, however long they stayed.

In a room across the wide corridor a calligrapher was at work, writing out a Koran. He was in his forties, in trousers and shirt, and he was sitting at a sloping desk. His hand was steady, unfree, without swash or elegance; but he was pleased to let us watch him plod on, dipping his broad-nibbed pen in the black ink. His face bore the marks of old stress; but he was at peace now, doing his newfound scribe's work in his safe, modern cell.

The director showed photographs of a meeting of Moslem university heads that had taken place in Qom two years before. And again, though it oughtn't to have been surprising, it was: this evidence of the existence of the subworld, or the parallel world, of medieval learning in its Islamic guise, still intact in the late twentieth century. The rector of Al Azhar University in Cairo, the director said, had been so impressed by what he had seen in Qom that he had declared that Qom students would be accepted without any downgrading by Al Azhar.

We walked down the steps. Against one wall there were stacks of the center's publications—not only *The Message of Peace* but also two new paperback books in Persian. One was an account of the Prophet's daughter, Fatima, who had married the Prophet's cousin, Ali, the Shia hero; this book was called *The Woman of Islam.* The other book or booklet, with a sepia-colored cover, was written, the director said, by an Iranian who had spent an apparently shattering year in England. This book was called *The West Is Sick.*

KHALKHALLI'S HOUSE WAS THE LAST IN A DEAD END, a newish road with young trees on the pavement. It was near sunset; the desert sky was full of color. There were men with guns about, and we stopped a house or two away. Behzad went and talked to somebody and then called me. The house was new, of concrete, not big, and it was set back from the pavement, with a little paved area in front.

In the veranda, or gallery, we were given a body search by a short, thickly built young man in a tight blue jersey, who ran or slapped rough hands down our legs; and then we went into a small carpeted room. There were about six or eight people there, among them an African couple, sitting erect and still on the floor. The man wore a dark-gray suit and was hard to place; but from the costume of the woman I judged them to be Somalis, people from the northeastern horn of Africa.

I wasn't expecting this crowd—in fact, a little court. I was hoping for a more intimate conversation with a man who, I thought, had fallen from power and might be feeling neglected.

A hanging judge, a figure of revolutionary terror, dealing out Islamic justice to young and old, men and women: but the bearded little fellow, about five feet tall, who, preceded by a reverential petitioner, presently came out of an inner room—and was the man himself—was plump and jolly, with eyes merry behind his glasses.

He moved with stiff little steps. He was fair-skinned, with a white skullcap, no turban or clerical cloak or gown; and he looked a bit of a mess, with a crumpled, long-tailed tunic or shirt, brown-striped, covering a couple of cotton garments at the top and hanging out over slack white trousers.

This disorder of clothes in one who might have assumed the high clerical style was perhaps something Khalkhalli cultivated or was known for: the Iranians in the room began to smile as soon as he appeared. The African man fixed glittering eyes of awe on him, and Khalkhalli was tender with him, giving him an individual greeting. After tenderness with the African, Khal-

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khalli was rough with Behzad and me. The change in his manner was abrupt, willful, a piece of acting: it was the clown wishing to show his other side. It didn't disturb me; it told me that having me in the room, another stranger who had come from far, was flattering to him.

He said, "I am busy. I have no time for interviews. Why didn't you telephone?"

Behzad said, "We telephoned twice."

Khalkhalli didn't reply. He took another petitioner to the inner room with him.

Behzad said, "He's making up his mind."

But I knew that he had already made up his mind, that the idea of the interview was too much for him to resist. When he came out—and before he led someone else in to his room—he said, with the same unconvincing roughness, "Write out your questions."

It was another piece of picked-up style, but it was hard for me. I had been hoping to get him to talk about his life; I would have liked to enter his mind, to see the world as he saw it. I had been hoping for conversation. I couldn't say what questions I wanted to put to him until he had begun to talk. But I had to do as he asked: the Iranians and the Africans were waiting to see me carry out his instructions. How could I get this hanging judge to show a little more than his official side? How could I get this half-clown, with his medieval learning, to illuminate his passion?

I could think of nothing extraordinary; I decided to be direct. On a sheet of hotel paper, which I had brought with me, I wrote: *Where were you born? What made you decide to take up religious studies? What did your father do? Where did you study? Where did you first preach? How did you become an ayatollah? What was your happiest day?*

He was pleased, when he finally came out, to see Behzad with the list of questions, and he sat cross-legged in front of us. Our knees almost touched. He answered simply at first. He was born in Azerbaijan. His father was a very religious man. His father was a farmer.

I asked, "Did you help your father?"

"I was a shepherd when I was a boy." And then he began to clown. Raising his voice, making a gesture, he said, "Right now I know how to cut off a sheep's head." And the Iranians in the room—including some of his bodyguards—rocked with laughter. "I did every kind of job. Even selling. I know everything."

But how did the shepherd boy become a mullah?

"I studied for thirty-five years."

That was all. He could be prodded into no narrative, no story of struggle or rise. He had simply lived; experience wasn't something he had reflected on. And, vain as he was ("I am very clever, very intelligent"), the questions about his past didn't interest him. He wanted more to talk about his present power, or his closeness to power; and that was what, ignoring the remainder of the written questions, he began to do.

He said, "I was taught by Ayatollah Khomeini, you know. And I was the teacher of the son of Ayatollah Khomeini." He thumped me on the shoulder and added archly, to the amusement of the Iranians, "So I cannot say I am *very* close to Ayatollah Khomeini."

His mouth opened wide, stayed open, and soon he appeared to be choking with laughter, showing me his gums, his tongue, his gullet. When he recovered he said, with a short, swift wave of his right hand, "The mullahs are going to rule now. We are going to have ten thousand years of the Islamic Republic. The Marxists will go on with their Lenin. We will go on in the way of Khomeini."

He went silent. Crossing his legs neatly below him, fixing me with his eyes, becoming grave, appearing to look up at me through his glasses, he said, in the silence he had created, "I killed Hoveyda, you know."

The straightness of his face was part of the joke for the Iranians. They—squatting on the carpet—threw themselves about with laughter.

It was what was closest to him, his work as revolutionary judge. He had given many interviews about his sentencing of the Shah's prime minister; and he wanted to tell the story again.

I said, "You killed him yourself?"

Behzad said, "No, he only gave the order. Hoveyda was killed by the son of a famous ayatollah."

"But I have the gun," Khalkhalli said, as though it was the next best thing.

Again the Iranians rolled about the carpet with laugh-

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ter. And even the African, never taking his glittering eyes off Khalkhalli, began to smile.

Behzad said, "A Revolutionary Guard gave him the gun."

I said, "Do you have it on you?"

Khalkhalli said, "I have it in the next room."

So at the end he had forced me, in that room full of laughter, to be his straight man.

It was fast-breaking time now, no time to dally, time for all visitors to leave, except the Africans. For some minutes young men had been placing food on the veranda floor. Khalkhalli, dismissing us, appeared to forget us. Even before we had put our shoes on and got to the gate, he and the African couple were sitting down to dinner. It was a big dinner; the clown ate seriously.

And at last our Lur driver could eat, and Behzad could repeat the sacramental moment of food-sharing with him. We drove back to the center of the town, near the shrine, and they ate in the café where we had waited earlier in the afternoon, in a smell of cooking mutton.

They ate rice, mutton, and flat Persian bread. It was all that the café offered. I left them together, bought some nuts and dried fruit from a stall, and walked along the river, among families camping and eating on the river embankment in the dark. Across the road from the embankment electric lights shone on melons and other fruit in stalls: a refreshing night scene, after the glare and colorlessness of the day.

When I was walking back to the café, and was on the other side of the river, I passed an illuminated shoe shop. It had a big colored photograph of Khomeini. I stopped to consider his unreliable face again: the creased forehead, the eyebrows, the hard eyes, the sensual lips. In the light of the shop I looked at the handful of nuts and *kishmish* raisins I was about to put in my mouth. It contained a thumbtack. Without that pause in front of Khomeini's picture, I would have done damage to my mouth in ways I preferred not to think of; and my unbeliever's day in Khomeini's holy city of Qom would have ended with a nasty surprise.

BEHZAD CAME FROM A PROVINCIAL TOWN, ONE OF THE famous old towns of Persia. His father was a teacher of Persian literature. About his mother Behzad had nothing to say—he spoke of her only as his mother—and I imagined that her background was simpler. He had studied for some time at an American school and he spoke English well, with a neutral accent. Now, at twenty-four, he was a science student at an institute in Tehran. He had an easy, educated manner, and a Persian delicacy. He was tall, slender, athletic. He went skiing and mountain-walking, and he was a serious swimmer.

The provincial background, possibly purely traditional on one side, the American school, the science institute in the capital, the athletic pursuits: it might have been said that for Behzad, living nearly all his life under the Shah, the world had opened up in ways unknown to his grandparents.

But that was my vision. I was twice Behzad's age. I had been born in a static colonial time; and in Trinidad, where I spent my first eighteen years, I had known the poverty and spiritual limitations of an agricultural colony where, as was once computed, there were only eighty kinds of job. I therefore, in places like Iran, had an eye for change. It was different for Behzad. Born in Iran in 1955, he took the existence of national wealth for granted; he took the expansion of his society for granted; he had an eye only for what was still unjust in that society.

I saw him as emerged, even privileged. He saw himself as poor, and as proof he said he didn't own a jacket; in winter he wore only a pullover. The idea of poverty had been given Behzad by his father, who, as a communist, had been imprisoned for some time during the Shah's rule. And that idea of poverty was far from mine in Trinidad twenty-five years before.

When he was a child—it would have been in the mid-sixties—Behzad had one day asked his father, "Why don't we have a car? Why don't we have a refrigerator?" That was when his father had told him about poverty and injustice, and had begun to induct him into the idea of revolution. In Behzad's house revolution had replaced religion as an animating idea. To Behzad it was even touched, like religion, with the notion of filial piety. And Behzad, in his own faith, was as rigid as any mullah in

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Qom in his. He judged men and countries by their revolutionary qualities. Apart from Persian literature, for which he had a special feeling, he read only revolutionary writers or writers he considered revolutionary, and I wasn't sure that he could put dates to them: Sholokhov, Steinbeck, Jack London. He had never been tempted to stray.

He told me, as we were walking about central Tehran two days after our trip to Qom, that there was no true freedom in the West. The workers were oppressed, exchanging their labor for the barest necessities. True freedom had existed only once in the world, in Russia, between 1917 and 1953.

I said, "But there was a lot of suffering. A lot of people were jailed and killed."

He pounced on that. "What *sort* of people?"

He had no religious faith. But he had grown up in Shia Iran, and his idea of justice for the pure and the suffering was inseparable from the idea of punishment for the wicked. His dream of the reign of Stalin was a version of the dream of the rule of Ali—the Prophet's true successor.

I said, "Have some of your friends changed sides now and decided that they are Moslems?"

"A few. But they don't know what they are."

He showed me the city of the revolution. On this tree-lined shopping avenue, in that burned-out building (its blackened window openings not noticeable at first in the fume-stained street), the Shah's soldiers had taken up their positions. They had fired on demonstrators. And here, in this doorway, a man had died. After six months the blood was barely visible: just dark specks on the dirty concrete. In two places someone had written, with a black felt pen, in Persian characters of a size that might have been used for a private note: *This is the blood of a martyr.* "Martyr" was a precise religious word; but Behzad could also read it politically.

On Revolution Avenue, formerly Shah Reza, opposite the big iron-railed block of Tehran University, were the publishers (mingled with men's shops) and the pavement book-sellers and cassette-sellers and print-sellers. The cassettes were of speeches by Khomeini and other ayatollahs; they were also—in spite of Khomeini's ban on music—of popular Persian and Indian songs. Some book-sellers had books in Persian about the revolution, its ideologues and its martyrs. Some had solider piles of communist literature—Persian paperbacks, and hard-back sets of Lenin or Marx in English, from Russia. One revolution appeared to flow into the other.

And there were photograph albums of the revolution. The emphasis in these albums was on death, blood, and revenge. There were photographs of people killed during the Shah's time; photographs of the uprising: blood in the streets, bodies in the morgues, with slogans daubed in blood on the white tiles; galleries of people executed after the revolution, and shown dead, page after page, corpse upon corpse. One corpse was that of Hoveyda, the Shah's prime minister: the black bullet hole in Hoveyda's old man's neck was clear in the photograph.

All the buildings in the university block—founded by the Shah's father—were disfigured with slogans. The university was the great meeting place of Tehran, and even on a day like this, a day without any scheduled event, it was full of discussion groups. Behzad said, "It goes on all the time." What did they talk about? He said, "The same things. Islam, communism, the revolution." It looked a pacific campus scene; it was hard to associate these young men in jeans and pretty shirts with the bloodiness celebrated in the books and albums across the road.

But violence was in the air, and just after we came out through the main gate we saw this incident. A student in a white shirt, small and with glasses, inexpertly and with some comic effort taped a leaflet onto the iron rails of the gate. The leaflet was a protest about the closing down of *Ayandegan*, the paper of the left. A workman near a food stall at the edge of the pavement walked slowly over, drew a red hammer and sickle on the leaflet, crossed the whole sheet with an X, slapped the student twice, in the middle of the pavement crowd; and then, without hurry, taped up the defaced leaflet more securely.

The student had ducked to save his glasses and his eyes. No one moved to help him. Even Behzad did nothing. He only said, as though appealing to me for justice, "Did you see that? Did you *see* that?"

The two revolutions appeared to flow together, the revolution of Khomeini, and what Behzad would have seen as the true revolution of the people. But they were distinct. The previous weekend Behzad and some of his group had gone to a village to do "constructive" work. They had run into trouble with the Revolutionary Guards: every village had its *komiteh*, young men with guns who were now the law in parts of Iran. The Guards, Moslems, didn't want communists in the village.

Who were these Moslem militants? Behzad said, "They're *lumpen.* Do you know the word?" The village Guards were *lumpen*, like the workman who had slapped the student. The doctrinal word helped Behzad; it enabled him to keep his faith in the people.

I WAS GOING ON TO PAKISTAN. MY FIRST PLAN HAD BEEN to go by bus, to drop down south and east in stages, through old towns with beautiful names: Isfahan, Yazd (important to Zoroastrians, Persians of the pre-Islamic faith, long since expelled, their descendants surviving in India as Parsis, "Persians"), Kerman, Zahedan. But Qom had given me enough of desert travel in midsummer; I didn't want now to run into *komitehs* in out-of-the-way places; and I could get no certain information about transport across the Pakistan border. I decided to go by air, straight to Karachi.

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TIME

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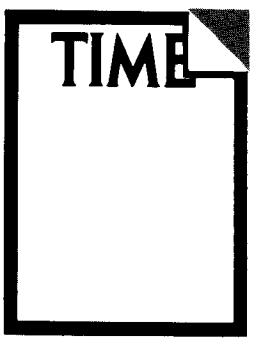

More goes into it.

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There were not many flights. The one I chose left at 7:30 in the morning, and Pakistan International Airlines said it was necessary to check in three hours before. I was on time, and I thought I had done the right thing. I was quickly through, with my little Lark bag. Half an hour later, when dawn was breaking, the queue was long and moving very slowly.

Just as, at Heathrow, the flight pen for Iran had been full of Iranians who had done their shopping in Europe and the United States, so now the Tehran airport was full of Pakistani migrant workers who had done their shopping in Iran. They were taking back a lot: boxes, trunks, big cardboard suitcases tied with rope, brown cartons stamped with famous names—Aiwa, Akai, Toshiba, National, names of the now universal bazaar, where goods were not associated with a particular kind of learning, effort, or civilization but were just goods, part of the world's natural bounty.

The plane that was to leave at 7:30 didn't arrive until ten. We began to taxi off at 11:25 but then were halted for a further hour, while American-made Phantoms of the Iranian Air Force took off. I thought they were training. They were in fact taking off on Khomeini's orders to attack the rebel Kurds in the west. Later, in Karachi, I learned that two Phantoms had crashed, and the news was curiously sickening: such trim and deadly aircraft, so vulnerable the inadequately trained men within, half victims, yet men that morning obedient to the will of God and the Twelfth Imam and full of murder.

To Kurdistan, following the Phantoms, went Ayatollah Khalkhalli, as close to power as he had boasted only ten days before in Qom. In no time, moving swiftly from place to place in the August heat, he had sentenced forty-five people to death. He had studied for thirty-five years and was never at a loss for an Islamic judgment. When in one Kurdish town the family of a prisoner complained that three of the prisoner's teeth had been removed and his eyes gouged out, Khalkhalli ordered a similar punishment for the torturer. Three of the man's teeth were torn out on the spot. The aggrieved family then relented, pardoned the offender, and let him keep his eyes.

It was Islamic justice, swift, personal, satisfying; it met the simple needs of the faithful. But we hadn't, in the old days, been told of this Iranian need. This particular promise of the revolution had been blurred; and we had read, mostly, *Down with fascist Shah.* Only Iranians, and some foreign scholars, knew that when Khomeini was a child—while the Qajar kings still ruled in Iran—Khomeini's father had been killed by a government official; that the killer had been publicly hanged; that Khomeini had been taken by his mother to the hanging and told afterward, "Now be at peace. The wolf has attained the fruit of its evil deeds."

In an advertisement in the New York *Times* in January of 1979, when he was still in exile in France, Khomeini had appealed to "the Christians of the world" as to people of an equal civilization. It was a different Khomeini who said in August, on Jerusalem Day (the day the Phantoms were sent against the Kurds): "The governments of the world should know that Islam cannot be defeated. Islam will be victorious in all the countries of the world, and Islam and the teachings of the Koran will prevail all over the world."

That couldn't have been said to the readers of the New York *Times.* Nor could this, spoken on the last Friday of Ramadan (and a good example of the medieval "logic and rhetoric" taught at Qom—certain key words repeated, used in varying combinations, and finally twisted): "When democrats talk about freedom they are inspired by the superpowers. They want to lead our youth to places of corruption . . . If that is what they want, then yes, we are reactionaries. You who want prostitution and freedom in every matter are intellectuals. You consider corrupt morality as freedom, prostitution as freedom . . . Those who want freedom want the freedom to have bars, brothels, casinos, opium. But we want our youth to carve out a new period in history. We do not want intellectuals."

It was his call to the faithful, the people Behzad had described as *lumpen.* He required only faith. But he also knew the value of Iran's oil to countries that lived by machines, and he could send the Phantoms and the tanks against the Kurds. Interpreter of God's will, leader of the faithful, he expressed all the confusion of his people and made it appear like glory, like the familiar faith: the confusion of a people of high medieval culture awakening to oil and money, a sense of power and violation, and a knowledge of a great new encircling civilization. That civilization couldn't be mastered. It was to be rejected; at the same time, it was to be depended on. □

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When the scientific method won't work

DEBATING THE UNKNOWABLE

BY LEWIS THOMAS

THE GREATEST OF ALL THE ACcomplishments of twentieth-century science has been the discovery of human ignorance. We live, as never before, in puzzlement about nature, the universe, and ourselves most of all. It is a new experience for the species. A century ago, after the turbulence caused by Darwin and Wallace had subsided and the central idea of natural selection had been grasped and accepted, we thought we knew everything essential about evolution. In the eighteenth century there were no huge puzzles; human reason was all you needed in order to figure out the universe. And for most of the earlier centuries, the Church provided both the questions and the answers, neatly packaged. Now, for the first time in human history, we are catching glimpses of our incomprehension. We can still make up stories to explain the world, as we always have, but now the stories have to be confirmed and reconfirmed by experiment. This is the scientific method, and once started on this line we cannot turn back. We are obliged to grow up in skepticism, requiring proofs for every assertion about nature, and there is no way out except to move ahead and plug away, hoping for comprehension in the future but living in a condition of intellectual instability for the long time.

It is the admission of ignorance that leads to progress, not so much because the solving of a particular puzzle leads directly to a new piece of understanding but because the puzzle—if it interests enough scientists—leads to *work*. There is a similar phenomenon in entomology known as stigmergy, a term invented by Grassé, which means "to incite to work." When three or four termites are collected together in a chamber they wander about aimlessly, but when more termites are added, they begin to build. It is the presence of other termites, in sufficient numbers at close quarters, that produces the work: they pick up each other's fecal pellets and stack them in neat columns, and when the columns are precisely the right height, the termites reach across and turn the perfect arches that form the foundation of the termitarium. No single termite knows how to do any of this, but as soon as there are enough termites gathered together they become flawless architects, sensing their distances from each other although blind, building an immensely complicated structure with its own air-conditioning and humidity control. They work their lives away in this ecosystem built by themselves. The nearest thing to a termitarium that I can think of in human behavior is the making of language, which we do by keeping *at* each other all our lives, generation after generation, changing the structure by some sort of instinct.

Very little is understood about this kind of collective behavior. It is out of fashion these days to talk of "superorganisms," but there simply aren't enough reductionist details in hand to explain away the phenomenon of termites and other social insects: some very good guesses can be made about their chemical signaling systems, but the plain fact that they exhibit something like a collective intelligence is a mystery, or anyway an unsolved problem, that might contain important implications for social life in general. This mystery is the best introduction I can think of to biological science in college. It should be taught for its strangeness, and for the ambiguity of its meaning. It should be taught to premedical students, who need lessons early in their careers about the uncertainties in science.

College students, and for that matter high school students, should be exposed very early, perhaps at the outset, to the big arguments currently going on among scientists. Big arguments stimulate their interest, and with luck engage their absorbed attention. Few things in life are as engrossing as a good fight between highly trained and skilled adversaries. But the young students are told very little about the major disagreements of the day; they may be taught something about the arguments between Darwinians and their opponents a century ago, but they do not realize that similar disputes about other matters, many of them touching profound issues for our understanding of nature, are still going on and, indeed, are an essential feature of the scientific process. There is, I fear, a reluctance on the part of science teachers to talk about such things, based on the belief that before students can appreciate what the arguments are about they must learn and master the "fundamentals." I would be willing to see some experiments along this line, and I have in mind several examples of contemporary doctrinal dispute in which the drift of the argument can be readily perceived without deep or elaborate knowledge of the subject.

THERE IS, FOR ONE, THE PROBLEM OF animal awareness. One school of ethologists devoted to the study of animal behavior has it that human beings are unique in the possession of consciousness, differing from all other creatures in being able to think things over, capitalize on past experience, and hazard informed guesses at the future. Other, "lower," animals (with possible exceptions made for chimpanzees, whales, and dolphins) cannot do such things with their minds; they live from moment to moment with brains that are programmed to respond, automatically or by conditioning, to contingencies in the environment. Behavioral psychologists believe that this automatic or conditioned response accounts for human mental activity as well, although they dislike that word "mental." On the other side are some ethologists who seem to be more generous-

Dr. Lewis Thomas is chancellor of the Memorial Sloan-Kettering Cancer Center. This article is based on a lecture in the 1981 Colloquium on Common Learning held by the Carnegie Foundation for the Advancement of Teaching.

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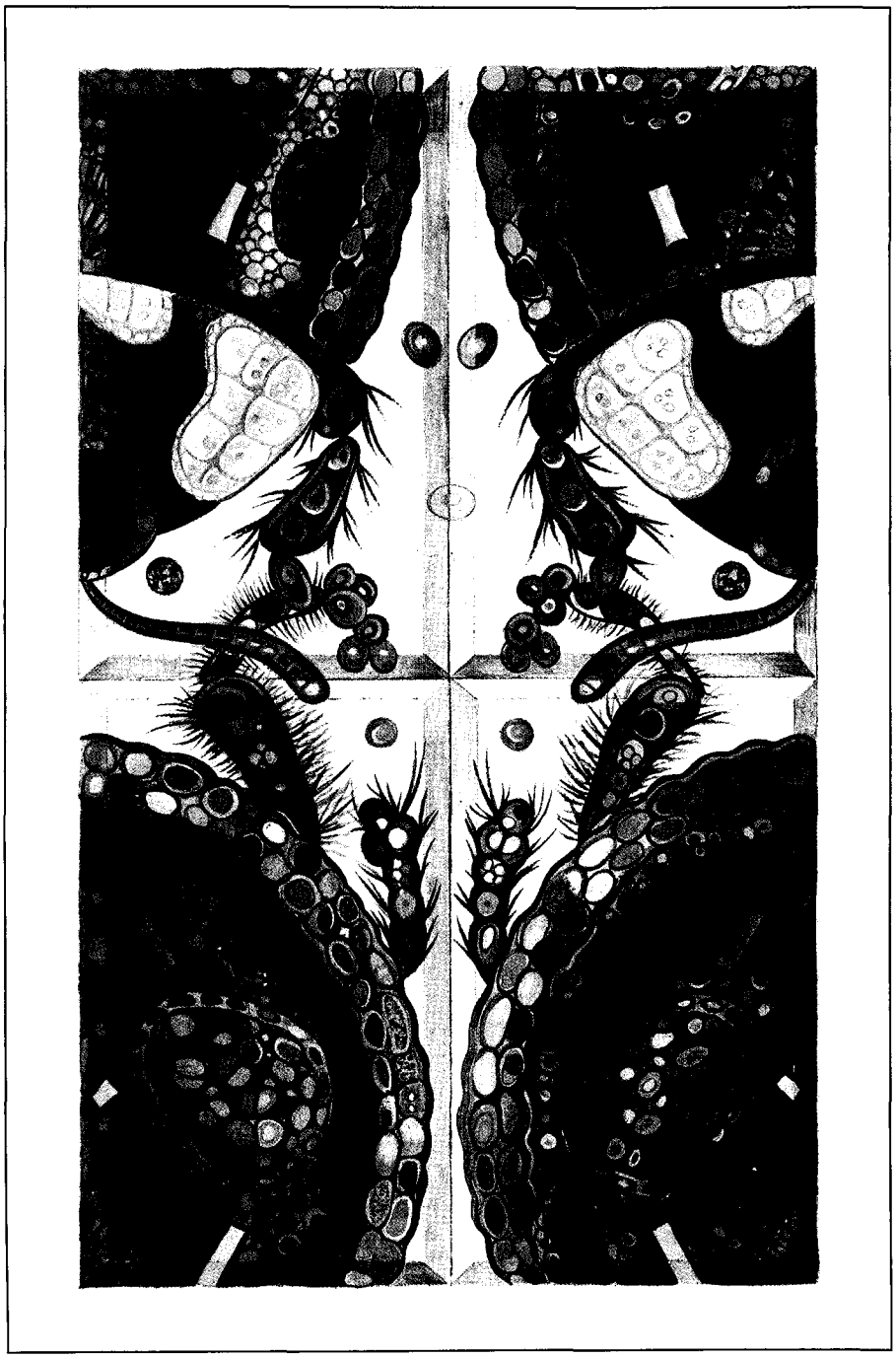

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minded, who see no compelling reasons to doubt that animals in general are quite capable of real thinking and do quite a lot of it—thinking that isn't as dense as human thinking, that is sparser because of the lack of language and the resultant lack of metaphors to help the thought along, but thinking nonetheless.

The point about this argument is not that one side or the other is in possession of a more powerful array of convincing facts; quite the opposite. There are not enough facts to sustain a genuine debate of any length; the question of animal awareness is an unsettled one. In the circumstance, I put forward the following notion about a small beetle, the mimosa girdler, which undertakes three pieces of linked, sequential behavior: finding a mimosa tree and climbing up the trunk and out to the end of a branch; cutting a longitudinal slit and laying within it five or six eggs; and crawling back on the limb and girdling it neatly down into the cambium. The third step is an eight-to-ten-hour task of hard labor, from which the beetle gains no food for itself—only the certainty that the branch will promptly die and fall to the ground in the next brisk wind, thus enabling the larvae to hatch and grow in an abundance of dead wood. I propose, in total confidence that even though I am probably wrong nobody today can prove that I am wrong, that the beetle is not doing these three things out of blind instinct, like a little machine, but is thinking its way along, just as we would think. The difference is that we possess enormous brains, crowded all the time with an infinite number of long thoughts, while the beetle's brain is only a few strings of neurons connected in a modest network, capable therefore of only three *tiny* thoughts, coming into consciousness one after the other: find the right tree; get up there and lay eggs in a slit; back up and spend the day killing the branch so the eggs can hatch. End of message. I would not go so far as to anthropomorphize the mimosa tree, for I really do not believe plants have minds, but something has to be said about the tree's role in this arrangement as a beneficiary: mimosas grow for twenty-five to thirty years and then die, unless they are vigorously pruned annually, in which case they can live to be a hundred. The beetle is a piece of good luck for the tree, but nothing more: one example of pure chance working at its best in nature—what you might even wish to call good nature.

THIS BRINGS ME TO THE SECOND example of unsettlement in biology, currently being rather delicately discussed but not yet argued over, for there is still only one orthodoxy and almost no opposition, yet. This is the matter of chance itself, and the role played by blind chance in the arrangement of living things on the planet. It is, in the orthodox view, pure luck that evolution brought us to our present condition, and things might just as well have turned out any number of other, different ways, and might go in any unpredictable way for the future. There is, of course, nothing chancy about natural selection itself: it is an accepted fact that selection will always favor the advantaged individuals whose genes succeed best in propagating themselves within a changing environment. But the creatures acted upon by natural selection are themselves there as the result of chance: mutations (probably of much more importance during the long period of ex-

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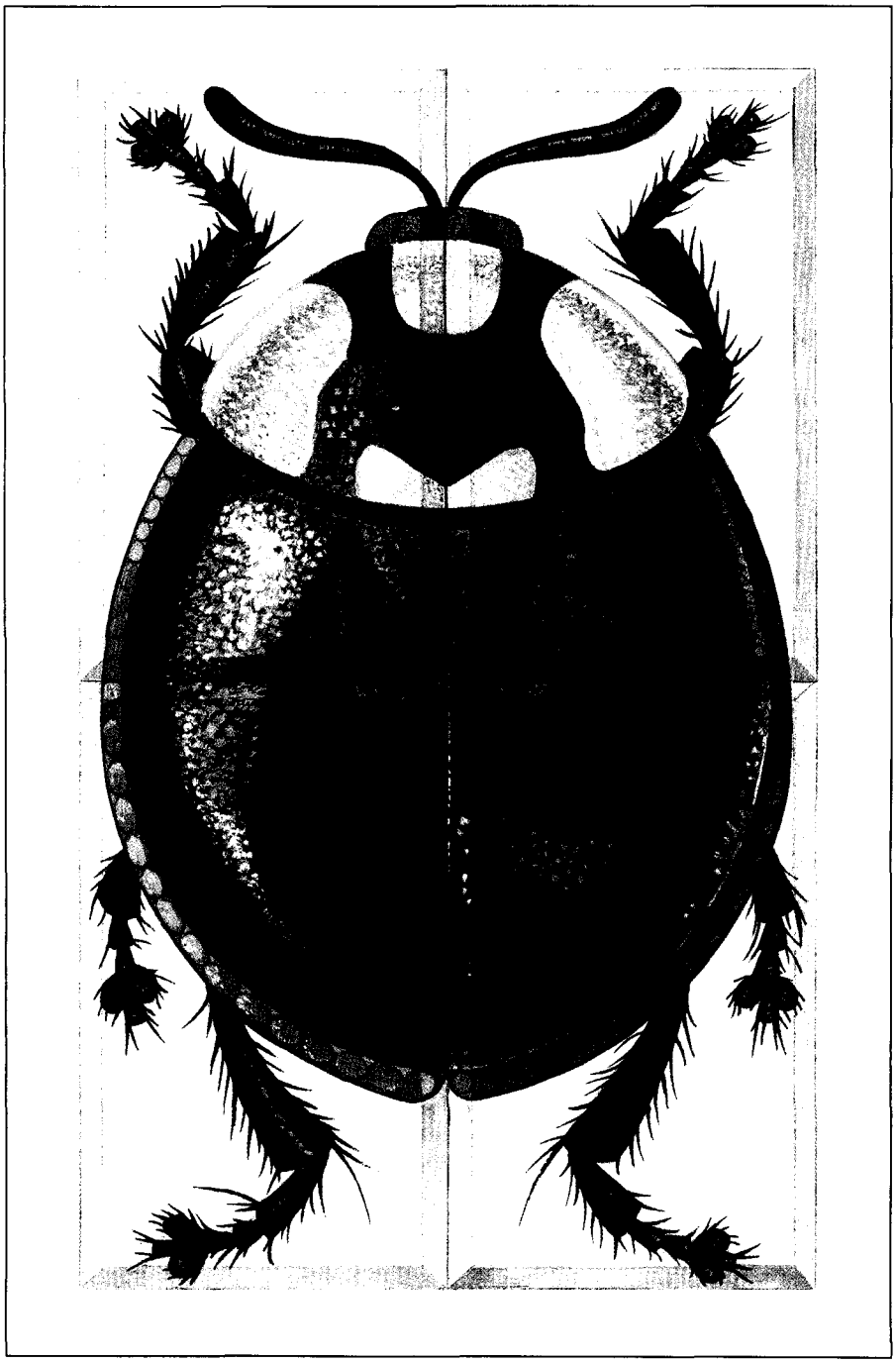
clusively microbial life starting nearly 4 billion years ago and continuing until about one billion years ago); the endless sorting and re-sorting of genes within chromosomes during replication; perhaps recombination of genes across species lines at one time or another; and almost certainly the carrying of genes by viruses from one creature to another.

The argument comes when one contemplates the whole biosphere, the conjoined life of the earth. How could it have turned out to possess such stability and coherence, resembling as it does a sort of enormous developing embryo, with nothing but chance events to determine its emergence? Lovelock and Margulis, facing this problem, have proposed the Gaia Hypothesis, which is, in brief, that the earth is itself a form of life, "a complex entity involving the Earth's biosphere, atmosphere, oceans and soil; the totality constituting a feedback or cybernetic system which seeks an optimal physical and chemical environment for life on this planet." Lovelock postulates, in addition, that "the physical and chemical condition of the surface of the Earth, of the atmosphere, and of the oceans has been and is actively made fit and comfortable by the presence of life itself."

This notion is beginning to stir up a few signs of storm, and if it catches on, as I think it will, we will soon find the biological community split into fuming factions, one side saying that the evolved biosphere displays evidences of design and purpose, the other decrying such heresy. I believe that students should learn as much as they can about the argument. In an essay in *Coevolution* (Spring 1981), W. F. Doolittle has recently attacked the Gaia Hypothesis, asking, among other things, ". . . how does Gaia know if she is too cold or too hot, and how does she instruct the biosphere to behave accordingly?" This is not a deadly criticism in a world where we do not actually understand, in anything like real detail, how even Dr. Doolittle manages the stability and control of his own internal environment, including his body temperature. One thing is certain: none of us can instruct our body's systems to make the needed corrections beyond a very limited number of rather trivial tricks made possible through biofeedback techniques. If something goes wrong with my liver or my kidneys, I have no advice to offer out of my cortex. I rely on the system to fix itself, which it usually does with no help from me beyond crossing my fingers.



Another current battle involving the unknown is between sociobiologists and antisociobiologists, and it is a marvel for students to behold. To observe, in open-mouthed astonishment, one group of highly intelligent, beautifully trained, knowledgeable, and imaginative scientists maintaining that all behavior, animal and human, is governed exclusively by genes, and another group of equally talented scientists asserting that all behavior is set and determined by the environment or by culture, is an educational experience that no college student should be allowed to miss. The essential lesson to be learned has nothing to do with the relative validity of the facts underlying the argument. It is the argument itself that is the education: we do not yet know enough to settle such questions.

ONE LAST EXAMPLE. THERE IS AN uncomfortable secret in biology, not much talked about yet, but beginning to surface. It is, in a way, linked to the observations that underlie

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the Gaia Hypothesis. Nature abounds in instances of cooperation and collaboration, partnerships between species. There is a tendency of living things to join up whenever joining is possible: accommodation and compromise are more common results of close contact than combat and destruction. Given the opportunity and the proper circumstances, two cells from totally different species—a mouse cell and a human cell, for example—will fuse to become a single cell, and then the two nuclei will fuse into a single nucleus, and then the hybrid cell will divide to produce generations of new cells containing the combined genomes of both species. Bacteria are indispensable partners in the fixation of atmospheric nitrogen by plants. The oxygen in our atmosphere is put there, almost in its entirety, by the photosynthetic chloroplasts in the cells of green plants, and these organelles are almost certainly the descendants of blue-green algae that joined up when the nucleated cells of higher plants came into existence. The mitochondria in all our own cells, and in all other nucleated cells, which enable us to use oxygen for energy, are the direct descendants of symbiotic bacteria. These are becoming accepted facts, and there is no longer an agitated argument over their probable validity; but there are no satisfactory explanations for how such amiable and useful arrangements came into being in the first place. Axelrod and Hamilton (*Science*, March 27, 1981) have recently reopened the question of cooperation in evolution with a mathematical approach based on game theory (the Prisoner's Dilemma game), which permits the hypothesis that one creature's best strategy for dealing repeatedly with another is to concede and cooperate rather than to defect and go it alone.

This idea can be made to fit with the mathematical justification based on kinship already accepted for explaining altruism in nature—that in a colony of social insects the sacrifice of one individual for another depends on how many of the sacrificed member's genes are matched by others and thus preserved, and that the extent of the colony's altruistic behavior can be mathematically calculated. It is, by the way, an interesting aspect of contemporary biology that true altruism—the giving away of something without return—is incompatible with dogma, even though it goes on all over the place. Nature, in this respect, keeps breaking the rules, and needs correcting by new ways of doing arithmetic.

THE SOCIAL SCIENTISTS ARE IN THE hardest business of all—trying to understand how humanity works. They are caught up in debates all over town; everything they touch turns out to be one of society's nerve endings, eliciting outrage and cries of pain. Wait until they begin coming close to the bone. They surely will someday, provided they can continue to attract enough bright people—fascinated by humanity, unafraid of big numbers, and skeptical of questionnaires—and provided the government does not starve them out of business, as is now being tried in Washington. Politicians do not like pain, not even wincing, and they have some fear of what the social scientists may be thinking about thinking for the future.

The social scientists are themselves too modest about the history of their endeavor, tending to display only the matters under scrutiny today in economics, sociology, and psychology, for example—never boasting, as they might, about one of the greatest of all scientific advances in our comprehension of humanity, for which they could be claiming credit. I refer to the marvelous accomplishments of the nineteenth-century comparative linguists. When the scientific method is working at its best, it succeeds in revealing the connection between things in nature that seem at first totally unrelated to each other. Long before the time when the biologists, led by Darwin and Wallace, were constructing the tree of evolution and the origin of species, the linguists were hard at work on the evolution of language. After beginning in 1786 with Sir William Jones and his inspired hunch that the remarkable similarities among Sanskrit, Greek, and Latin meant, in his words, that these three languages must "have sprung from some common source, which, perhaps, no longer exists," the new science of comparative grammar took off in 1816 with Franz Bopp's classic work "On the conjugational system of the Sanskrit language in comparison with that of the Greek, Latin, Persian and Germanic languages"—a piece of work equivalent, in its scope and in its power to explain, to the best of nineteenth-century biology. The common Indo-European ancestry of English, Germanic, Slavic, Greek, Latin, Baltic, Indic, Iranian, Hittite, and Anatolian tongues, and the meticulous scholarship connecting them was a tour de force for research—science at its best, and social science at that.

It is nice to know that a common language, perhaps 20,000 years ago, had a root word for the earth which turned, much later, into the technical term for the complex polymers that make up the connective tissues of the soil: humus and what are called the humic acids. There is a strangeness, though, in the emergence from the same root of words such as "human" and "humane," and "humble." It comes as something of a shock to realize that the root for words such as "miracle" and "marvel" meant, originally, "to smile," and that from the single root *sa* were constructed, in the descendant tongues, three cognate words, "satisfied," "satiated," and "sadness." How is it possible for a species to show so much wisdom in its most collective of all behaviors—the making and constant changing of language—and at the same time be so habitually folly-prone in the building of nation-states? Modern linguistics has moved into new areas of inquiry as specialized and inaccessible for most laymen (including me) as particle physics; I cannot guess where linguistics will come out, but it is surely aimed at scientific comprehension, and its problem—human language—is as crucial to the species as any other field I can think of, including molecular genetics.

But there are some risks involved in trying to do science in the humanities before its time, and useful lessons can be learned from some of the not-so-distant history of medicine. A century ago it was the common practice to deal with disease by analyzing what seemed to be the underlying mechanism and applying whatever treatment popped into the doctor's head. Getting sick was a hazardous enterprise in those days. The driving force in medicine was the need to *do* something, never mind what. It occurs to me now, reading in incomprehension some of the current reductionist writings in literary criticism, especially poetry criticism, that the new schools are at risk under a similar pressure. A poem is a healthy organism, really in need of no help from science, no treatment except fresh air and exercise. I thought I'd just sneak that in. □

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CROSSING THE DIVIDE

You stand at the top of the ridge and, stretched below you,
See a wild valley down to a wild river,
And if you, this night,
Are to lie by that riverside, you must make your way
As water would through gullies and spurred ravines
In a rite of passage.

One step, and each bush, each wildflower will be holy,
Each stone a dangerous god. From every pool
And spring where you kneel
The lips of a god will rise to meet your lips
And will drink from yours. Each turn of wind, each bird cry
Will quaver a warning.

You will carry a different name now without knowing
What it is: it will be there in your face,
In your empty hands,
In the way you walk or lie down, in how you breathe,
In how your eyes may waver from far to near,
Close or come trembling open.

You will be known all day by what you do,
Not what you were, by how you bear yourself
As you move among spirits
And pass among the scattered bones of the dead
Who came, like you, to speak in an old language
Through a new silence

In hope the words that rose from their heartroots
At last (after the gods had thrown aside
Feathers and rain,
The glitter of standing water, the masks of bedrock,
And had said their names) would be by nightfall
Not dust but singing.

—David Wagoner

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The Hardy Boys and the Microkids build a computer

FLYING UPSIDE DOWN

BY TRACY KIDDER

ONE HOLIDAY MORNING IN 1978, TOM WEST TRAVELED to a city that was situated, he would later say guardedly, "somewhere in America." He entered a building as though he belonged there, strolled down a hallway, and let himself quietly into a windowless room. Just inside the door, he stopped.

The floor was torn up; a shallow trench filled with fat power cables traversed it. Along the far wall, at the end of the trench, enclosed in three large, cream-colored steel cabinets, stood a VAX 11/780, the most important of a new class of computers called "32-bit superminis." To West's surprise, one of the cabinets was open and a man with tools was standing in front of it. A technician, still installing the machine, West figured.

Although West's designs weren't illegal, they were sly, and he had no intention of embarrassing the friend who had told him he could visit this room. If the technician had asked West to identify himself, West wouldn't have lied and he wouldn't have answered the question, either. But the moment went by. The technician didn't inquire. West stood around and watched him work, and in a little while the technician packed up his tools and left.

Then West closed the door and walked back across the room to the computer, which was now all but fully assembled. He began to take it apart.

West was the leader of a team of computer engineers at a company called Data General. The machine that he was disassembling was produced by a rival firm, Digital Equipment Corporation, or DEC. A VAX and a modest amount of adjunctive equipment sold for something like $200,000, and as West liked to say, DEC was beginning to sell VAXes "like jellybeans." West had traveled to this room to find out for himself just how good this computer was, compared with the one that his team was building.

West spent the morning removing the VAX's twenty-seven printed circuit boards. He'd take one out, study it, make a few notes, and then put it back. These boards were flat plates, each about the size of a shirt cardboard. In regular columns across their surfaces lay small rectangular boxes. Each of these boxes enclosed an integrated circuit, or "chip"; if bared and examined under a microscope, the chips would look like mazes—imagine the wiring diagram of an office building inscribed on a fingernail. It's possible to get inside the chips, inside the littlest boxes inside the boxes that constitute the central works of a modern computer, and, bringing back the details, to create a functionally equivalent copy of a machine. "Reverse engineering" is the name for that art, and it takes time and equipment. West called such engineering "knock-off copy work." He had a simpler purpose. He was not going to imitate VAX; he just wanted to size it up.

Looking into the VAX, West felt that he saw a diagram of DEC's corporate organization. He found the VAX "too complicated." He did not like, for instance, the system by which various parts of the machine communicated with each other; for his taste, there was too much protocol involved. The machine expressed DEC's cautious, bureaucratic style. West was pleased with this idea.

His hands in the machine, West was also studying and counting parts; many of the chips had numbers on their housings that were like names familiar to him. When he was all done, he added everything up and decided that it probably cost $22,500 to manufacture the essential hardware of a VAX. He left the machine exactly as he had found it.

"I'd been living in fear of VAX for a year," West said one evening afterward, while driving along Route 495 in central Massachusetts. "I wasn't really into G-2. VAX was in the public domain, and I wanted to see how bad the damage was. I think I got a high when I looked at it and saw how complex and expensive it was. It made me feel good about some of the decisions we've made."

West was forty but looked younger. He was thin and had a long narrow face and a mane of brown hair that spilled over the back of his collar. These days he went to work in freshly laundered blue jeans or pressed khakis, in leather moccasins, and in solid-colored long-sleeved shirts, with the sleeves rolled up in precise folds, like the pages of a letter, well above his bony elbows. He expostulated with his hands. When dismissing someone or some idea or both, he made a fist and then exploded it, fingers splaying wide. The gesture was well known to those engineers who worked for him. Long index fingers inserted under either side of the bridge of his glasses signified thought, and when accompanied by a long *"Ummmmmmmmh"* warned that some emphatic statement was near. Indeed, West made few statements that

Tracy Kidder is the author of The Soul of a New Machine, *a book about the building of the computer "Eagle," soon to be published by the Atlantic Monthly Press.*

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were not emphatic. Seen at the wheel of his shiny red Saab, he made a picture of impatience. His jaw was set; he had a forward lean. Sometimes he briefly wore a mysterious smile. He was a man on a mission.

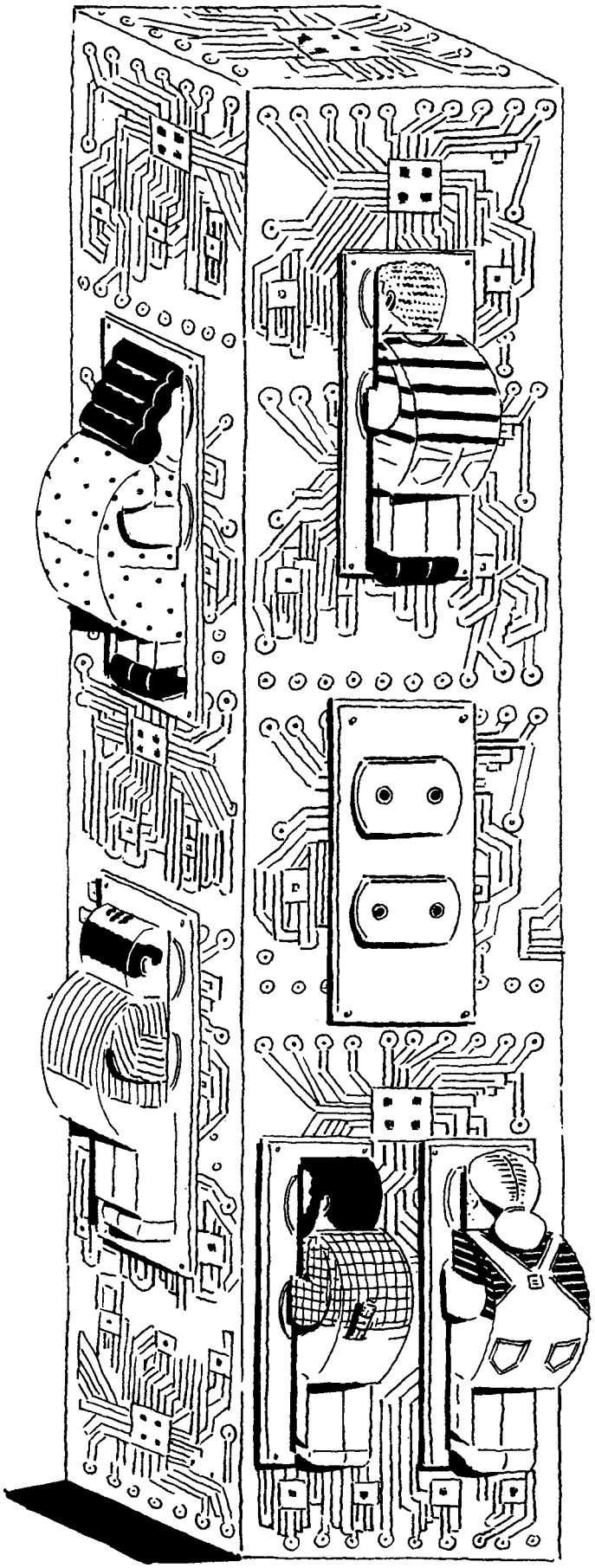
"With VAX, DEC was trying to minimize the risk," West said, as he swerved around another car. "We're trying to maximize the win . . ."

IN THE EARLY 1960s, SEVERAL COMPANIES BEGAN TO manufacture computers that were much less powerful but also much smaller and cheaper than the machines then in existence. These new devices were called minicomputers. By 1978, the increasingly imprecise term "minicomputer company" could be applied to about fifty corporations. Minicomputer sales had grown from about $1.5 million worth of shipments in 1968 to about $3.5 billion in 1978, and most interested parties believed that the business would continue to grow by about 30 percent a year.

DEC was one of the first minicomputer companies, and it was the largest corporation in this segment of the computer industry: the IBM of minis. In 1968, three young computer engineers who left DEC and a salesman from another company founded Data General. Minicomputer companies were known for playing rough; Data General had acquired a reputation as one of the roughest of them all. "The Darth Vader of the computer industry" was the way one trade journalist described the company. Meanwhile, Data General thrived. It made good computers inexpensively and it managed its business adroitly. By 1978, Data General was taking in about half a billion dollars a year. It was only ten years old, and its name had just been added to the list of the nation's 500 largest industrial corporations. Moreover, for most of its history Data General had maintained the highest profit margins in the computer industry, after IBM.

Making computers is a risky enterprise. Young, successful computer companies often get into serious trouble, largely because success in their business means rapid, stressful growth. Data General grew by more than 30 percent a year for a decade, and all the while the technology of computers was changing.

At some computer companies, it has fallen mainly to engineers, working below decks, as it were, to make the first decisions about new products. Data General was such a company, and one often heard that its president, Edson deCastro, himself a very successful computer engineer, liked "self-starters." By 1978, though the company's balance sheet had never looked better, it was becoming apparent that Data General had need of initiative from its engineers. Into the world of the minicomputer had come a new kind of machine—the 32-bit supermini. DEC's VAX was the best-known example of such a machine, and several other of Data General's rivals had also produced superminis. Data General, meanwhile, had



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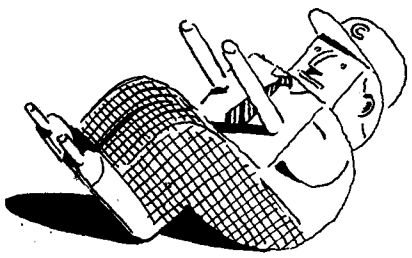
yet to offer one of its own. "A disaster," Tom West said of this situation.

The most important characteristic of the 32-bit mini was its system of storage. Storage in a computer resembles a telephone system, in the sense that every piece of information in storage is assigned a unique number, so that it can be readily found. If the standard length of a phone number is seven digits, then enough unique numbers can be generated to serve the needs of New York City; but if a three-digit area code is added, every telephone customer in America can have a unique number. The 32-bit supermini was a computer with an area code. Since the advent of Data General, most minis had been "16-bit" machines. The standard length of the numbers that such a machine assigns to items in its storage is 16 bits, 16 binary digits. A 16-bit machine can directly generate only about 65,000 unique numbers for its storage system. A 32-bit machine, however, can directly generate some 4.3 *billion* different numbers.

All interested parties agreed that the demand for superminis would be huge; the market might be worth several billion dollars by the 1980s, some said. If Data General failed to produce a 32-bit machine or something equivalent, it could expect to lose some old customers, and, perhaps more important, it would forfeit one of the next decade's best opportunities for gaining new business. The company could not now be the first to enter this new market, but that was all right; sometimes it was better not to be first. However, Data General had to field a suitable machine fairly soon, because customers get married to computer companies in intricate ways, and once they've married elsewhere they're often gone for good. Time was running out, Tom West maintained. "We're gonna get schmeared if we don't react to VAX," he said.



DATA GENERAL'S HEADQUARTERS STAND NEAR THE intersection of two superhighways some thirty miles west of Boston. It is a low-lying brick building with TV cameras mounted on the corners of its roof, and all in all looks like a fort. Its official name is Building 14 A/B. Inside, it is essentially divided into an upstairs and a downstairs. The executives work upstairs. The lower level of Building 14, subterranean in front and at ground level in back, is another country. It belongs mainly to engineers.

West led the way down into this region one evening in the late fall of 1978, through confusing corridors and past mysterious doors that were locked up and bearing signs that read "RESTRICTED AREA." Then the hallways ended, and all around, under fluorescent light, lay fields of cubicles without doors. Their walls stood too low for privacy. Most contained a desk with a computer terminal on it. In many, there was a green houseplant. Green plants poked their heads, like periscopes, above the cubicles' walls. "The great statement," said West, gesturing at the foliage and smiling faintly. "It's basically a cattle yard."

By day, the basement held a homogeneous-looking throng, made up largely of young white males wearing jeans and corduroys and hiking boots; few wore neckties, but neat grooming was the rule. Now and then a visitor might catch a glimpse of a fellow with wild hair, dressed in Army-surplus clothes, but such figures were rare.

West's team specialized in the design and development of the hardware of new computers. It was only one of several such teams at Data General, and it was not the largest or, in the fall of 1978, the most prestigious. It was named the Eclipse Group, after the current generation of 16-bit Data General computers. The Eclipse Group, which numbered about thirty then, occupied a portion of a field of cubicles and a few narrow, windowless offices, one of which belonged to West. No sign announced that this was the group's territory. At night, it did seem that more lamps burned on in the Eclipse Group's offices and cubicles than in many other parts of the basement. At some moments during the day, the area had the atmosphere of a commuter train, and at others it reminded one of a college library on the eve of exams: silent and intent youngsters leafing through thick documents and peering into the screens of computer terminals. Conversation, especially the speech of the senior engineers, contained words and phrases such as these: a *canard* was anything false, usually a wrongheaded notion entertained by some other engineering group or other company; things could be done in ways that created *no muss, no fuss*, that were *quick and dirty*, that were *clean. Fundamentals* were the source of all right thinking, and weighty sentences often began with the adverb *fundamentally*, while *realistically* prefaced many flights of fancy. There was talk of *wars, shootouts, hired guns*, and people who *shot from the hip. The win* was the object of all this sport, and *the big win* was something that could be achieved by *maximizing* the lesser one. From the vocabulary alone, one could have guessed that West had been there and that these engineers were up to something special.

In fact, they were building their own 32-bit supermini, a machine that West fervently hoped would be a worthy rival to DEC's VAX and maybe the basis for Data Gener-

ILLUSTRATIONS BY STEVEN GUARNACCIA

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al's ascent in the Fortune 500. Oddly, though, West and some of the senior engineers on his team expressed the paradoxical feeling that they were building a machine absolutely essential to the company but were doing it largely on their own. "I think we're doing it in spite of Data General," said one of West's lieutenants in the middle of the project.

Setting up intramural competition among various parts of a company is an old strategy of management. Many firms in the computer industry, most notably IBM, have used it; they deliberately establish internal competition, partly on the theory that it's a useful prelude to competition with other companies. At Data General, such internal struggle had the name "competition for resources." An engineering team such as the Eclipse Group sometimes had to vie with other engineering groups for the right to produce a new computer. A year or so before, some members of the Eclipse Group had found themselves in such a competition, against a much larger team of Data General engineers, situated in North Carolina. The Eclipse Group had been competing with the team in North Carolina essentially for the right to produce Data General's supermini, what West would later call "the answer to VAX." The Eclipse Group's project had been scrapped. There had been an intramural competition for resources, and the Eclipse Group had lost. But West had decided not to abide by the decision. He had launched the Eclipse Group on another big project, one that would rival North Carolina's. Doing so had taken him some months. It had also required that he pursue some indirect measures.

West had believed that whatever its other virtues, the machine that the company engineers in North Carolina were building did not represent a timely solution to the problem that DEC's VAX posed for Data General. West also wanted to save the Eclipse Group and himself from the fate of working only on small projects. So he had borrowed ideas from anyone who had some to share, and by the very early spring of 1978 he had settled on a new plan. The Eclipse Group would build a schizophrenic computer, one that would work as both a 16-bit Eclipse and a 32-bit supermini. The proposed machine was nicknamed "Eagle."

The production of software, the programs that tell computers what to do, costs customers time and money and sometimes entails awful administrative problems. Eagle would protect old customers' substantial investments in 16-bit Eclipse software and would offer prospective buyers at least the possibility of savings in software development. At the same time, this machine would fulfill Data General's need for a computer with enlarged "logical address space." And West thought that the front office was likely to let the Eclipse Group build this computer, if it was presented correctly.

"You gotta distinguish between the internal promotion to the actual workers and the promoting we did to other parts of the company," West later explained. "Outside the group, I tried to low-key the thing. I tried to dull the impression that this was a competing project with North Carolina. I tried to sell it externally as not much of a threat. I was selling insurance; this would be there if something went wrong in North Carolina. It was just gonna be a fast, Eclipse-like machine. This was the only way it was gonna live. We had to get the resources quietly, without creating a big brouhaha."

And so, when he proposed the idea to people outside his group, West made Eagle appear to be a modest project, and he got permission to go ahead. But when he proselytized engineers who might help build this machine, it was clear that West's intentions weren't modest at all.

From the point of view of a purist ("technology bigot" is the usual term), Eagle in its vague outlines looked messy. Indeed, some engineers called the plan "a kludge," computer jargon for any ill-conceived thing. West varied his pitch to suit his audience. His general remarks ran as follows: Eagle might not look it from the outside, but in fact it was going to be a new, a fast, a "sexy" machine. It would be software-compatible with 16-bit Eclipses, not because it was going to be just another Eclipse, but because that feature would make it a "big win" commercially. They were going to build Eagle in record time, working "flat out by definition," because the company needed this machine desperately. And when they succeeded and Eagle went out the door with their names on it, as West put it, and started selling like jellybeans, then they would all be heroes.

Once in a while West and some members of his staff asked themselves whether the company's president, deCastro, might not have orchestrated everything, including their feeling that they were on their own. Whatever its origin, though, that feeling was evidently invigorating. "Anytime you do anything on the sly, it's always more interesting than if you do it up front," one of West's lieutenants remarked. West said, wearing his wry smile, "We're building what I thought we could get away with."

BY THE SPRING OF 1978, WEST HAD GATHERED A CADRE of fairly experienced engineers. But to build Eagle, it was soon clear, more engineers were needed.

West conferred with an old colleague named Carl Alsing. Alsing was in his mid-thirties, a veteran, and a practitioner of an abstruse but essential craft called microcoding. He was soft-spoken. He had a mischievous air and—in all matters, it seemed—an aversion to the blunt approach. Alsing had joined the Eagle project without any coaxing, and was the only one of West's three lieutenants to do so. West regarded Alsing as one of the few people around Building 14 in whom he could confide, and for his part, Alsing, who was something of a watcher—a moviegoer—was fascinated by West, especially at the onset of the project.

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"We need more bodies, Alsing," West said that spring. "Shall we hire kids?"

A famous computer engineer had remarked that he liked to hire inexperienced engineers fresh from college, because they did not usually know what was supposed to be impossible. West had heard the remark. He liked the sound of it. He figured, too, that "kids" would be relatively inexpensive to hire. Moreover, this could be another way of disguising his true intentions: who would imagine that a bunch of recruits could build an important new computer? To Alsing, the idea was vintage West. It looked risky and compelling. Alsing became the Eclipse Group's chief recruiter.

West and Alsing agreed that they would have to hire the very best of that year's college graduates, even though, they told each other, they might be hiring their own replacements, their own "assassins." That was all very well, but the demand for young computer engineers far exceeded the supply. What enticement could the Eclipse Group offer that companies such as IBM could not? Clearly, it had to be the Eagle project itself. It was thought to be a fine thing in the fraternity of hardware engineers to be a builder of new computers—in the local idiom, it was the "sexy" job—and, Alsing knew, most big companies just didn't offer recruits the opportunity to be such a person right away. So they had what West called "a high-energy story."

But the new recruits were going to be asked to work at a feverish pace almost at once, and they'd have no time to learn the true meaning of the Eclipse Group's mysterious rite of initiation, which was known as "signing up." In the Eclipse Group, when you signed up, you agreed to do whatever was necessary for success and to forsake time with family, hobbies, and friends—if you had any of those left, and you might not, if you had signed up for too many projects before. In effect, a person who signed up declared, "I want to do this job and I'll give it my heart and soul." Formal declarations weren't called for. A simple "Yeah, I'll do that" could constitute signing up. But only veterans knew what such a statement might entail.

The Eclipse Group solicited applications. One candidate listed "family life" as his main avocation. Alsing and another of West's lieutenants were skeptical when they saw that entry. Not that they wanted to exclude family men, being such men themselves. But Alsing thought: "He seems to be saying he doesn't want to sign up." The other lieutenant pondered the application. "I don't think he'd be happy here," he said to himself.

Any likely-looking candidate was invited to Building 14, and the elders of the group would interview the young man; it was usually a young man, for female engineers specializing in the hardware of computers were still quite scarce. If the recruit was a potential microcoder, his interview with Alsing was crucial. And a successful interview with Alsing constituted signing up.

Alsing would ask the young engineer, "What do you want to do?"

If the recruit seemed to say, "Well, I'm just out of grad school and I'm not really sure," then Alsing would usually find a polite way to abbreviate the conversation. But if the recruit said, for instance, "I'm really interested in computer design," then Alsing would press on. The ideal interview would proceed in this fashion:

"What interests you about computer design?"

"I want to build one," says the recruit.

"What makes you think you can build a new computer?"

"Hey," says the recruit, "no offense, but I've used some of the machines you guys have built. I think I can do a better job."

"Well, we're building this machine that's way out in front in technology," says Alsing. "We're gonna design all new hardware and tools. Do you like the sound of that?"

"Oh, yeah," says the recruit.

"It's gonna be tough," says Alsing. "If we hired you, you'd be working with a bunch of cynics and egotists and it'd be hard to keep up with them."

"That doesn't scare me," says the recruit.

"There's a lot of fast people in this group," Alsing goes on. "It's gonna be a real hard job with a lot of long hours. And I mean *long* hours."

"No," says the recruit. "That's what I want to do, get in on the ground floor of a new architecture. I want to do a big machine. I want to be where the action is."

"Well," says Alsing, pulling a long face. "We can only let in the best of this year's graduates. We've already let in some awfully fast people. We'll have to let you know."

"We tell him that we only let in the best—then we let him in," Alsing said, after it was all done. "I don't know. It was kind of like recruiting for a suicide mission. You're gonna die, but you're gonna die in glory."

GETTING A MACHINE OUT THE DOOR MAY HAVE BEEN the object of the team's labors. But the main source of motivation lay elsewhere. One day an old hand (old in a relative sense, since most in the team were very young) reflected on his job: "I said, 'I will do this. I want to do it. I recognize from the beginning it's gonna be a tough job. I'll have to work hard, and if we do a good job . . . we get to do it again.' " West called this "pinball." "You win one game, you get to play another."

Salaries within the Eclipse Group were respectable. At the start of the project, in 1978, a "kid" earned about $20,000 a year. But engineers are regarded, and regard themselves, as professionals; therefore, they'd get no extra pay for overtime, no matter how many hours they worked. For previous jobs, old hands had received some stock options, and there was talk that the team's mem-

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WORSENING CONDITION

BY EDWARD SOREL

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bers might get options if Eagle was a success. No one in authority actually stated that promise, it seemed. "But it sure as hell was suggested!" said one of the recruits. No one in the team said he expected to receive large amounts of stock, however. Most insisted that they weren't working on Eagle for money. When they talked about rewards, they spoke mainly of pinball.

By the fall of 1978, the preliminaries were complete. The kids—about a dozen of them—were hired, the general sign-up had been performed, and at least one possible reward, the Sisyphean one, had been clearly established. They had already begun to design the computer.

Eagle took its first material form in paper, in bound books as large as atlases, which contained the intricate geometric depictions of the circuits (the "schematics"), and in a fat volume of pages filled up with line after line of 0's and 1's—the microcode, the synaptic language that would fuse the physical machine with the programs that would tell it what to do. One could think of this small library of microcode and schematics as the engineers' collected but not wholly refined thoughts on a variety of subjects. The language was esoteric, but many of the subjects were as familiar as multiplication.

Chips, the product of the era of microelectronics, took most of the pure physics and plain electrician's work from the engineers' endeavor. Some circuit designers likened the chips to a collection of children's building blocks, which they had to assemble. Some referred to the entire realm of chip design and manufacture as "technology," as if to say that putting those chips together to make a computer was something else.

Many of the chips that Eagle's circuit designers used came ready-made to perform certain operations, such as addition. Others weren't completely ready-made, but in all cases one of the routine parts of the engineers' job was transferring their ideas to silicon and wire. The hardest part was concocting those ideas. Creating Eagle's hardware was primarily a matter of constructing long skeins of logical thought. Some indication of the complexity of the job lies in the fact that Eagle would contain thousands of chips. The designers had to figure out what each of those chips should do and how to connect it to the others so that Eagle could perform all the operations in its "instruction set," and some of those operations were very tricky ones. That was only half of the job. The microcode had to be written, too. Each operation in Eagle's repertoire would be performed at the direction of a "microprogram"; each microprogram would consist of one or more (usually more) "microinstructions"; and each microinstruction would consist of seventy-five discrete electrical signals. Thus, in order to equip Eagle to perform just one of its roughly 400 basic operations, the engineers had to plan in complete detail the passage of hundreds, sometimes thousands, of signals through the circuitry. They had to ensure, of course, that there was an absolute marriage between those signals and the circuits. And they had to be sure that the performance of one operation did not foul up the performance of another. Possibilities for creating internal contradictions were numerous. The engineers had to try to anticipate all of them, and the difficulty of doing so was exacerbated by the fact that more than twenty people were creating this design in a hurry.

A brief description of the physical engine they were making could have been set to the music of "Dry Bones." This device was connected to that device, and so on. There was the microsequencer, which managed the microcode, sending it out to other parts of the engine on command from the instruction processor, or IP, which made assumptions about what basic chores the machine would be asked to perform in the future. There was the input/output controller, the IOC, which mediated between user and machine. The system cache was full of fast memory circuits and kept tabs on the IP. The address translation unit, ATU, kept track of the machine's main storage, and the control console (C/C), among other roles, acted as Eagle's therapist, by monitoring certain parts of the engine for problems and flaws, which are also known as "crocks." Practically every device relied upon the powers of the arithmetic and logic unit (the ALU), or "number cruncher," the heart of any computer; it did Eagle's math. There was also a clock, which ticked every 220 billionths of a second, telling all the rest of the machine that one microinstruction had ended and another had begun.

A great deal of the designing took place in silence, while engineers sat in their cubicles and paced in hallways and stood in their showers at home. It was the sort of work that was hard to escape, some said. One starts to imagine that trees and roads embody block diagrams and microprograms; this was the banal sensation that a member of the team had in mind when he said that it took three days for him to get Eagle out of his mind. During this time, West spent many hours in his office, staring at the team's designs of the circuitry. Usually, he drove away from Building 14 at high speed. "I can't talk about the machine," he said one evening, as he bent forward over the wheel. "I've gotta keep life and computers separate, or else I'm gonna go mad."

SOME OF THE YOUNG ENGINEERS WERE ASSIGNED TO work on microcode; they were called, and called themselves, "the Microkids." Those who went to work on the hardware, the actual circuitry, were known as "the Hardy Boys." This was the first real job for most of them. For some, at least, it was a strange beginning. Eager to make a good impression, and thinking it was the proper thing to do, one of the Hardy Boys set out, when he arrived, to meet his new team's leader. He went into West's office, extended his hand, and said, "Hi, I'm Dave." He would never forget that experience. "West just

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sat there and stared at me. After a few seconds I decided I'd better get out of there."

For a Microkid named Jon Blau, the first months on the job seemed relatively serene. After Blau was assigned his cubicle, Alsing and the group's chief secretary helped him to find his way around the in-house computing system. Then Chuck Holland, a submanager under Alsing, drew for him a clear picture of the entire microcoding job. Holland had divided the overall task into several smaller ones, and he let Blau choose one from among them. Blau decided that he would like to write the code that would tell Eagle how to perform a lot of its arithmetic. He had always liked math, and he felt that this job would help him understand it in new, insightful ways. He spent most of his first months reading, in order to prepare himself. All in all, life in the Eclipse Group did not seem very different from life at his alma mater, MIT.

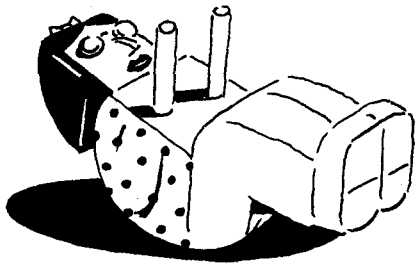
Then one day in the fall of 1978, Blau was sitting in his cubicle studying Booth's Algorithm, a procedure for doing multiplication, and he was thinking to himself, "This is pretty slick," when Alsing poked his head around the partition and said, "There's a meeting."

Blau trooped into a conference room with most of the other new members of the team, joking and feeling a little nervous. There waiting for them were the brass: the vice president of engineering, another lower-level but probably important executive, and West, sitting in a corner, chewing on a toothpick. The speeches were brief. Listening intently, Blau heard all about the history of 32-bit minicomputers. They were really catching on, and the word was that DEC would probably introduce a new model of VAX in about nine months. Eagle was already late. It had to be designed and made ready for market by April, in just six months. That wouldn't be easy, but if any engineers could do it this group could, the bosses said.

Blau felt proud of himself and pleased about this first real job of his when he left that meeting. He went right back to his cubicle, and picked up Booth's Algorithm. Then, suddenly, he felt it, like a little trickle of sweat down his back. "I've gotta hurry," he said to himself. "I've gotta get this code written today. This is just one little detail. There's a hundred of these . . . "

Practically the next time he looked around him it was midnight, but he had done what he'd set out to do. He left the basement thinking, "This is life. Accomplishment. Challenges. I'm in control of a crucial part of this big machine." He looked back from his car at the blank, brick, monolithic back of Building 14 and said to himself, "What a great place to work." Tomorrow he would have to start encoding an instruction called FFAS. He told himself that this wouldn't be too hard. When he woke up the next morning, however, FFAS was upon him. "Oh, my God! FFAS. They need that code next week. I'd better hurry."

"The pressure," Blau later recalled. "I felt it from inside of me."



AROUND THIS TIME, A HARDY BOY NAMED DAVE EPstein was dreaming up the circuits of the device called the microsequencer. No other parts of Eagle could begin to function without it, so the manager of the Hardy Boys, Ed Rasala, wanted it designed quickly. "How long will it take you?" Rasala asked Epstein.

Epstein replied, "About two months."

"Two months?" Rasala said. "Oh, come on."

"Okay," said Epstein. "Six weeks."

"I just wrote my own death warrant," Epstein thought. Six weeks didn't look like enough time. He took to staying at his desk half the night, and the microsequencer took shape more quickly than he had expected. He felt so happy that he went down the hall and told Rasala, "Hey, Ed, I think I'm gonna do it in four weeks."

"Oh, good," Rasala said.

Epstein returned to his cubicle. Then he realized what had happened. "I just signed up to do it in four weeks."

Afterward, Epstein remarked, "I don't know if I'm complaining, though. I don't think I am. I work well under pressure."

Not everyone was stimulated. One newcomer was astonished at the way the team was being managed. Hardy Boys and Microkids were making deals, saying to each other, in effect, "I'll do this function in microcode if you'll do this one in hardware." He was a little older than the other newcomers and had some experience in computer design, and he had never seen it done this way. "There's no grand design," he said. "People are just reaching out in the dark, touching hands." He was having some problems with his own part of the design and he felt sure that he could solve them properly if the managers would simply give him time. But they kept saying there was no time. No one seemed to be in control. Nothing was ever explained. The team's leader rarely even said hello to his troops. Make a mistake, however, and the managers came at you from all sides.

"The whole management structure . . . " said this young engineer. "Anyone in Harvard Business School would have barfed."

If West had heard that remark, he might have taken it as a compliment. Carl Alsing had often heard West use the phrase "flying upside down." The inspiration for it

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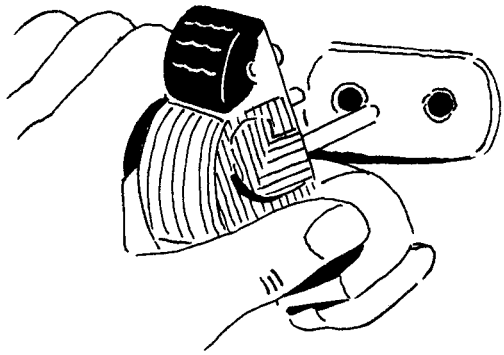
evidently came from a friend of West's who used to do that very thing in his airplane. By the term, West seemed to mean the assumption of large risks, and the ways in which he applied it left Alsing in no doubt that flying upside down was supposed to be a desirable activity, the very stuff of a vigorous life.

Ed Rasala acknowledged that West made a project more dramatic, "definitely more dramatic" than it had to be. Rasala smiled at the thought, however, and he did believe it when West said that they had to fly upside down in order to ship Eagle on time. As for Alsing, he admired West's style: "I screamed and hollered over NAND gates and microinstructions when we built the first Eclipse, but I'm too old to feel that way about computers now. This would be crashingly dull if I was doing it for someone else. West is interesting. He's the main reason why I do what I do."

First coaxing, then threatening, saying, "If you don't do this, your job description is inoperative," West had persuaded a senior engineer named Steve Wallach to work on Eagle. Wallach was a combative engineer, in his thirties. West called him "a walking dictionary and encyclopedia of computers." Wallach had not liked the looks of this machine; he had called it "a wart on a wart on a wart" and "a bag on the side of the Eclipse." But as he got deeply involved, he began to like the looks of Eagle. He was the machine's chief architect. One can think of a computer's architecture as a description of what the machine will do; it leaves out the intricate details of the computer's construction. But Wallach, who was doing a fine job, in West's opinion, wasn't really finished before West had the team designing printed circuit boards. Before the team could clean up its designs, West was ordering prototype boards. Before the prototype boards could possibly be perfected, West was arranging for the construction of final, etched boards. And long before they could know whether Eagle would ever become a functioning computer, West had the designers stand in front of a camera and describe the various parts of the machine. The result of this last act of hubris (there were many others) was a videotape some twenty hours long. West planned to use it, when the right time came, as a tool for spreading the news of Eagle all around Building 14. "Pretty gutsy," he said, gesturing at the canisters of videotape in his bookcase.

West maintained that the team had to show quick and constant progress, whether or not any progress was being made, in order to get the various arms of the company interested in helping out—in order, that is, to compete successfully for resources. One evening he offered an additional explanation. "I'm flat out by definition. I'm a mess. It's terrible," he said. He paused, and added, "It's a lot of fun."

Others echoed that remark. The team was working long hours now, often twelve a day, and usually they put in six days a week. They spoke about the harsh effects of such labor, but there was relish in their voices. One day Jon Blau said, "I've had difficulty forming sentences lately. . . . Pieces of your life get dribbled away. I'm growing up, having all those experiences, and I don't want to shut them out for the sake of Data General or this big project." But he said that on the whole he was happy. He added, "That's the big kick, that the guys with the purse strings are trusting a bunch of kids to come up with the answer to VAX. That's what bowls me over, that they haven't just put us in a corner somewhere, doing nothing."



ALTOGETHER, IT TOOK THEM ABOUT SIX MONTHS TO dream up Eagle. By January of 1979, two partially assembled prototypes were sitting in the basement, behind the locked doors of a small lab. But Eagle was not yet the equal of a hand-held calculator. The team had to make the computer work. They had to test it, and find, identify, and repair the flaws in its design. They called this part of the project "debugging."

Eagle had been designed too quickly for prudence, and at the onset of the debugging the question arose, in West's mind especially, whether "fatal" flaws in the design were about to be revealed. Pursuing what he called "what's-the-earliest-date-by-which-you-can't-prove-you-won't-be-finished scheduling," West had promised his bosses that Eagle would be debugged and brought to life by April. Of course, one can't ever know how long a debugging will take; the debugger delves into uncertainty. West was very nervous. He had Rasala make up a debugging schedule that would bring the machine in by April. Rasala put the Hardy Boys on two shifts in the lab. They made some progress right away, and West felt relieved. Then progress all but ceased. In the local idioms, they were moving "three steps forward, two steps back" and the debugging schedule was "slipping a week a week."

Right around the time when West was brooding over these discouraging reports from the lab, he got word from his boss upstairs that the company team in North Carolina was going to miss its deadline by a considerable margin. This was momentous news. West had always maintained that Eagle was crucial to the company. Now he was being proved right. He did not feel like celebrat-

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ing, though. At the moment, he was afraid that Eagle might never get debugged, and yet he was being told that it had to be done within four months. Everyone in the company was depending on the Eclipse Group now; that was the message West thought he received from upstairs. Carl Alsing thought it might be the message that West decided to receive. "If you say you're gonna do it in a year and you don't take it seriously, then it'll take you three years," Alsing explained. "The game of crazy scheduling is in the category of games that you play on yourself, in order to get yourself to move."

AN ENGLISHMAN OF THE NINETEENTH CENTURY named Charles Babbage, who is best known as the father of the modern computer, was one of the first to express the principle that the way to get a job done cheaply is to divide it into small parts that require relatively unskilled and therefore inexpensive labor. This is a basic principle of modern industrial organization. The general problem that it causes, one that has kept many consultants and psychologists busy over the years, is that when jobs are reduced to tasks so small and simple that the people performing them scarcely have to think, then work becomes boring and workers alienated. Most jobs were boring, in the computer industry and elsewhere, Alsing suspected, and he'd heard of systems of management that made even the building of a new computer sound dull. West, by contrast, had an exalted notion of what it meant to build a new machine; he spoke of "getting way out on the edge of what your mind can comprehend." He said, "It's for the kind of guy who likes to climb up mountains." According to the theory that West expressed to Alsing, computer engineers—the "winners" among them, anyway—would motivate themselves and work passionately, their only reward pinball, if they were given real responsibility for creating a new machine. That was how Eagle was being managed.

In West's lexicon, these ideas were subsumed in the word "trust." He'd added the term to his vocabulary that fall, and the ways in which he used the word made Alsing wonder if either of them had ever heard it before. "Trust is risk, and risk-avoidance is the name of the game in business," West said in praise of trust. Although he scarcely seemed to notice them, West often bragged about the engineers on his team behind their backs, and he could draw convincing portraits of most. He believed that they were bound together by webs of mutual *trust*. They'd signed up to do a job for him, and he in turn *trusted* them to get it done. He did not attempt to keep complete control, by breaking every task into meaningless fragments.

But the debugging wasn't going well, and in the circumstances, watching from his lair of an office was strenuous work for West. Alsing had known West back in the days when West was an engineer and not a manager. In Alsing's opinion, West had been just a competent circuit designer, but he was a very adept debugger. West wanted to be a debugger again. He wanted to go into the lab and will that machine into life, Alsing thought. But if West barged in there now, he would be admitting that he didn't really trust his team. The magic would be lost. So West was staying away from the lab and worrying instead.

Almost every morning now, West called Alsing into his office, closed the door, and asked, "What's really going on in the lab, Alsing?"

Alsing made soothing replies. Consoling the boss, it seemed to him, had become part of his job, and not necessarily the easiest part.

The tension among the recruits seemed palpable. Alsing could feel it in the air, he said. One day, early in the debugging, in a cubicle right outside West's door, a couple of Microkids began to laugh—first one, then the other, then both of them, more and more raucously. Alsing was sitting nearby, in his own cubicle. He heard the laughter. In the midst of it, his phone rang.

It was West. "If you don't shut those guys up I'm gonna kill 'em!"

Alsing went out and asked the offending Microkids to do their laughing elsewhere. "It was awful," he said afterward. "I felt so embarrassed. I felt like one of those old supervisors from the 1800s who used to hire children and work them eighteen hours a day."

West took a day off and drove to the seacoast, to look at sailboats.

In the evenings, West would usually call a halt to flying upside down and climb out of the role of the tough, mean manager. He would leave his office door ajar, as an invitation, and, leaning back, his hands fallen still, he would entertain almost any visitor. But on the evening when West heard the news about North Carolina, nightfall seemed to bring him no relief. West had a wild air, as if his office were a cage. He talked on and on. He had grown perceptibly thinner in the past few months, and his hands looked outsized. As he spoke, he pushed his hair back, he drove his index fingers up under the bridge of his glasses, he made fists and exploded his fingers outward. His hands, one imagined, had primitive will; they wanted to get into the prototype Eagles.

West said that he had been told the company would be "in a lot of trouble" if Eagle weren't debugged by April. "Suppose I quit?" he asked. "I could just say, 'The hell with it,' and go . . . " Maybe he would buy a boat and sail away from Data General. No, he wouldn't do that yet. He'd see this project through, but only this project. "I'm not gonna do the next machine. I'm gonna give somebody else the chance to fail. I'm gonna get totally out of computers."

Saying he would quit was for West the equivalent of saying that he sometimes felt like quitting, and the statement was a substitute for the act itself.

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THE LAB WAS BORROWED SPACE, A CORNER OF A LARGER lab, sealed off by a thin steel partition. It was no bigger than most suburban living rooms and more crowded than most. Along one cinder-block wall stood the source of anxiety, a pair of Eagles. They were two bare metal frames, their tops about shoulder-high. Inside each frame, exposed to view (computers in this state are said to have their "skins" off), was a shelf full of boards. Small flat cables ran among the boards, and further inside, below the shelves, were many bundles of multicolored wire. Eagle was a tangle of wire. A system console, which looked like a large typewriter, attended each prototype, and a magnetic tape drive stood next to one. The tape drive is often shown on TV and in movies, in order to signify the presence of a working computer. Probably it is chosen because the reels of tape spin rapidly and thus prove that something is going on. In fact, though, tape drives are among the slowest parts of a computing system. The real action takes place inside and between the boards. To get a look at it, one needs special tools—boxy little machines, covered with switches, called "logic analyzers." They sat on low, wheeled carts. Each analyzer had a small screen. In essence, one engineer explained, the analyzers were cameras. They took pictures of what happened inside the computer. Eagle would do a cycle of work every 220 nanoseconds, or billionths of a second. Hooked up to some part of the machine, an analyzer could take pictures of what happened there in each of 256 cycles and play those pictures back on command. "It's funny," said Ed Rasala. "I feel very comfortable talking in nanoseconds. I sit at one of these analyzers and nanoseconds are *wide*. I mean, you can see them go by. 'Jesus,' I say, 'that signal takes twelve nanoseconds to get from there to there.' Those are real big things to me when I'm building a computer. Yet when I think about it, how much longer it takes to snap your fingers, I've lost track of what a nanosecond really means." He paused. "Time in a computer is an interesting concept."

One evening, when the lab was very still, everyone there bent to some task, one young engineer fiddled with a prototype Eagle. He was having a problem with the board he had designed. The machine, he said, kept "going to never-never land" whenever he asked it to add, and he was trying to take a picture with an analyzer of what was going wrong inside.

A straight white line ran horizontally across the analyzer's small blue screen. Nibbling his nails absentmindedly, the engineer made some arrangements around the prototype Eagle. Then, his nails still at his lips, he turned to the analyzer.

Something had happened. The straight white line on the screen had rearranged itself into a jagged shape. The young engineer stared at this picture. Slowly, he rotated his hand and took most of his knuckles in his teeth.

The jagged line on the screen was a picture of an electronic event that had taken place, in infinitesimal time, just a moment before. Though it was a common sort of picture in the lab, all of a sudden it looked dreadful.

This young engineer was, as it happened, one of those who did not enjoy flying upside down. He was capable, a Microkid said, of coming up with remarkable insights about the innards of a computer; there was no doubting his abilities. But he'd had trouble with the team's top managers and with his piece of Eagle's hardware. Many of the recruits felt that they were being given substantial freedoms. Clearly, though, time to revise was not one of them. This engineer was unhappy because he had been denied the right to fix the problem in his board in the way he thought was proper. In addition, he felt he had been insulted on a number of occasions. Perhaps most important, he felt worn out.

As the debugging continued, he felt under extreme pressure, which collected in his stomach. It hurt every day. This sort of work, even the occasional bad stomach, used to be fun. "Part of the fascination," he said, "is just little boys who never grew up, playing with erector sets. Engineers just don't lose that, and if you do lose it, you can't be an engineer anymore." He went on, "When you burn out, you lose enthusiasm. I always loved computers. All of a sudden I didn't care. It was all of a sudden a job."

One weekend some time before, he had visited what he called "a *very* liberal arts college" in Vermont. He was strolling across the campus when a young woman, bare to the waist, walked by. "She was a miracle of biological engineering," he said. "I was so stunned that I walked into the door of a geodesic dome. Although blood was pouring down the bridge of my nose, I was completely oblivious to it."

Back at Data General, one day during the debugging, his weariness focused on the logic analyzers and the small catastrophes that come from trying to build a machine that operates in billionths of a second. He went away from the basement of Building 14 that day, and left this note in his cubicle, on top of his computer terminal: "I'm going to a commune in Vermont and will deal with no unit of time shorter than a season." □

The conclusion of this two-part article will appear in the August issue.

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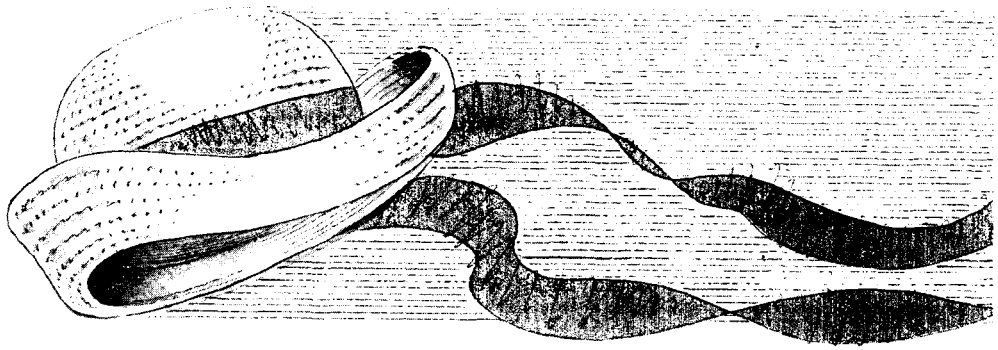

An Atlantic "First"

IN THE ZOOT CAR

BY HEIDI JON SCHMIDT

THE NIGHT BEFORE MY BIRTHDAY, MY SISTER AUDIE filled my mother's car with flowers she had picked in the gardens in town. Hyacinths, delphiniums, narcissus, every shade of lilac, overflowed the back seat, screening the rear window, spilling onto the ground when we opened the doors. Ma didn't care. The town people didn't like her, and if Audie wanted to run through their gardens in twilight, scissors flashing as the blossoms fell into her arms, Ma wouldn't stop her. She smiled and raised her eyebrows to me—she hadn't told Audie to go, but now her little white car was full of pinks and lavenders and blues and we gathered them in triumph, overwhelmed by fragrance and humidity.

"I'll swoon," I said, thinking that to swoon would be to allow the flowers their full impression, meaning to entertain my mother.

She laughed. "Swoon later," she told me. "Help me carry them inside first." It didn't matter where they came from or who they were for; my mother seemed to own them. She turned toward me and smiled. "Go look at yourself in the mirror with all those lilacs in your arms," she said. "You look like a painting."

We spent all day cutting them, arranging them in crystal vases and milk bottles, even filling the sink in the guest bathroom with them; we had no guests. I had other presents: flowered stationery, a silvery-green straw hat—a bowler—with a green ribbon, books of plays, records, a printed cotton skirt, and a vee-necked leotard. Pop was taking me, next week, for my driver's test. He wanted Audie to take the flowers back to the gardens they came from.

Heidi Jon Schmidt is a student at the Iowa Writers' Workshop and a recent graduate of Bennington College.

"Don't be as stuffy as those people are, Joey," Ma said. "They probably won't even realize the flowers are gone."

"We have the same flowers here," Pop said. "We've got daffodils choking the pachysandra in front." He went outside.

Audie's hair was cut so straight across the bottom that it looked like a blonde broom. She poked an apple branch into the center of one vase and straightened up, smiling.

Ma came behind her and kissed the top of her head. "You're lucky they didn't come after you with shotguns," she said.

By afternoon we did have a guest. The car came carefully up the driveway, seeming to float slightly over its wheels. It was the same colors as a fancy wing tip shoe. Something from the 1940s. A zoot car.

"Is that Cappy?" Ma cranked open one of the upstairs windows and leaned out. "Joey, it's my brother. Kids, your uncle Cappy's here." She pulled one white bloom from a vase and tucked it in her hair on the way down the stairs. I was behind her, in new clothes, new perfume. No flower would stay in my hair. Cap's voice was enormous.

"Where's the birthday girl?" he was asking, embracing my mother, the grinning Audie awaiting her turn.

I climbed over the porch railing into the garden. "There she is!" Cappy said. "There's my princess. She's growing up pretty, she's going to be as pretty as her ma."

The car was mine. Uncle Cap gave me the keys and showed me all the buttons, to open the windows and the trunk, to move the radio antenna up and down. The seats were beige leather, the top was beige linen, the paint was metallic brown. It was a Lincoln Continental, eight years

ILLUSTRATION BY TIM LEWIS

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old, as wide and square as a river barge. I stood in the driveway with the keys in my hand, beyond disbelief. It might as well have been a rocket.

"She can't keep a gift like this," Pop said. "It's too much. This is absurd." Cappy had gone in to call a taxi to take the train home.

"He wants her to have it. He'll be terribly disappointed if you don't let her keep it."

"It's some kind of illegal payoff, you know that."

"Well, Katie didn't do anything wrong. Don't punish *her* for it."

They stood on the porch, hushed and arguing. At the sound of a door slamming inside, Ma dropped her hands from her hips and came over to me.

"Be sure to thank him, honey," she said, pushing my hair back from my face. "It's a beautiful car."

Theater, that's my mother's business. Pinstriped patent-leather Lincoln Continentals might rain from the heavens and she would be graciously, nonchalantly thankful for each. Her blouses were never ironed but stretched tight across the shoulders, wrinkled at the sleeves. Still, she had only to throw her head back, laughing, and the men in a room would gather around her, talking politics, psychology, theater, touching her shoulder. The men always seemed like Uncle Cappy: large, opinionated, with thick graying hair.

Cappy called to her from the porch, "You can drive it too, Elly, if Kate will let you." He handed the registration to my father as he came down. "It's in your name, Joe . . ."

"Cappy, we can't let you do this." Pop started off strong. He was right. The car seemed a burden to me, as if I would have to carry it. "It's too much, we can't accept it."

"It's registered to you, kiddo; if you don't want to let her drive it, that's fine." Cappy kissed me, over my ear, through my hair. "My princess deserves a proper chariot," he said.

UNTIL I GOT MY LICENSE I WAS ALLOWED TO DRIVE IT between the house and the corner, half a mile. We had to go to New York on Saturday, though. Ma had a meeting and she'd take Audie and me to see Grandma while she was there. It was the first really hot day that year—the lilacs were drooping from their branches. Audie and I sat at the kitchen table in city clothes, eating breakfast.

"I'm going to stop off and see Jack Cirillo on the way home," Ma said.

Pop was buttering toast. He looked up over his glasses at her. "Why?"

"I have to talk to him. He's producing . . . theater stuff. I have to talk to him about the playhouse." Ma was wearing a shirt with birds on it and a white cotton skirt. Laugh lines, or squint lines, fanned out from her eyes. She looked steadily at Pop and he looked away. I wondered why she wanted to see Jack Cirillo too. Audie glanced across at me, raising her eyebrows.

"I need the car later," he said. "I'm going to buy lawn seed."

"We'll take the Lincoln."

Quietly, Pop said, "I will not have you driving my daughters to New York in a car that may or may not lose its brakes, or its steering, or its headlights at any time."

"Katie," Ma said, "are you afraid to ride in your car? Audie, are you frightened of the car?"

"Of course I'm not afraid of the car," Audie said. "I could probably fix the car, if anything broke." On her arm, Audie wore a water transfer tattoo of some fake motorcycle gang. Her dress was blue, with long ribbons tied at the neck and little shiny buttons all the way down the front.

"I don't care," I said, "but if we take the VW you won't be able to get your seeds."

"I *wish* you'd pull your hair off your face, at least when you're in the kitchen," Ma said to me.

I shuffled away, with Audie in tow, out through the living room to the front window. In the driveway, my zoot car glistened.

"Ellen." My father's voice came from the kitchen. "You know your brother, and you know that car is in some way illegal, possibly dangerous. Will you just wait until I've had a chance to check on it before you cross the state line?"

"Don't be so melodramatic. Do you think they'll slap me in leg-irons and haul me off to prison?" She was laughing, and her voice softened so that I couldn't hear her words. She came through the living room and ran lightly up the stairs. Out the window behind her I could see Pop going up the hill in back of the house, shaking his head.

WE WERE EXACTLY A MILE FROM HOME (I COULD SEE on the special odometer for trips) when Ma pulled over and asked if Cappy had showed me how to put the top down. Audie leaned over the seat to watch as I worked the little chrome lever that opened the trunk slowly, as the roof folded over our heads, as the trunk ground into place over it. The exposed sky was brilliant, the sun was hot on my shoulders. We set off again, laughing, screaming to each other over the wind, waving to everyone: other cars, ladies pushing oversized lawn mowers, the people in wedding regalia outside a church. Ma drove very slowly—she said she was frightened of traffic. We missed nothing all the way to New York, and nothing missed us. By the time we got there it was too late to stop at Grandma's. Ma double-parked the car and left us to guard it. They won't tow my children away, she said.

While she was gone we planned what to do if, indeed.

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they should tow her children away. Could we scramble out in different directions, run between buildings, and leave the car to its fate? Could we pretend to speak only some other language and not know double-parking was illegal in America? We practiced speaking in tongues. Audie reminded me of the Lorelei—we combed our hair and hoped policemen would be moved to overlook the substance of the car. No policeman came, though. The buildings rose so high they seemed to taper together above the narrow street.

A huge truck pulled up behind us. I could see the driver lift his arm and jerk his elbow down to pull the horn, but it startled me anyway. Surely every cop in New York had heard it. I tried to explain to the driver, in sign language, that I didn't have my license yet and could ruin my life by trying to move the car. The endless sound of the horn made me expect a steamship to come roaring up between the buildings toward us. Audie and I, dwarfed by the noise, watched each other over the seat. If my mother heard it from the tenth floor I'm sure she didn't look out to find the source. Finally, as if we were some kind of obstruction that the usual methods failed to dissolve, the driver climbed down from the cab and came toward us. He was sturdy, but not as tall as I had expected, seeing him in the truck. He was not much older than we were, and Audie and I could handle him, I thought.

"Who put this thing here?" he asked me.

"My mother," Audie said. He couldn't berate her mother. He looked at us, and I looked at us too. At sixteen and fourteen, we were only slightly fleshed. Audie had little biceps from basketball; I had breasts. Our hair was brushed one hundred times a day, outside and in. Mine hung over most of my face. I wore my new leotard and my new skirt, my knees protruding sharply from underneath, and I wanted to put my hat on so much that my hands trembled in its direction as if they were not in my control.

"Can either of you drive?" he asked.

"I can," I said.

He seemed doubtful. "Do you have the keys?"

I did. "This is my car," I told him, and I glanced up to see if he was surprised that a woman as young as myself should possess a wing tip car, but he simply put both hands on the door and swung over it and into the front seat.

"We can't go very far," I said, handing him the keys. "My mother'll be out any minute."

He just looked at me. "I don't want to go anywhere in *this*," he said. "I want to get this out of the way."

Ma came running out through the revolving door. She stopped, seeing the truck and the car, and she smiled a wide, deceiving smile at me before she went around to the driver's side.

"Oh, dear, am I in the way? I'm awfully sorry. I have a terrible time understanding the parking in New York. It's so nice of you to move the car for me, but we're about to go, so we'll just get it out of your way."

The man was staring down at the pedals, and as my mother prattled over his bowed head he began to look rather insubstantial.

"I'm Ellen Fairlie," Ma was saying, "and these are my daughters, Kate and Audie." She smiled, and her hair brushed across her shoulder as she leaned down to shake his hand.

"Ronnie Garkofsky," he said, clearing his throat. "This street is too narrow. I've got some kind of problem on this street every week. Sometimes I get two wheels up on the sidewalk and just drive through."

Audie laughed. "I'll bet they get out of the way then," she said.

"You should see it." He grinned. "Even in New York, people are afraid of an eighteen-wheeler."

There were horns behind the truck now, all the way to the end of the block. The sun was shining straight down between the buildings and the noise was rising toward it, like a tide. Ronnie Garkofsky shook Ma's hand and ran back to his truck. Ma started the Lincoln.

"I'm gone twenty minutes and you're all ready to run off with a perfect stranger," she said.

Audie turned around, lifted her arm into the air, and made a yanking motion, as if pulling an overhead horn. Ronnie pulled. His horn cut through the little hoots and toots of the cars behind us and seemed to send us forward along the street. He pulled it once more before he turned, and we didn't see him again.

ON THE WAY TO JACK CIRILLO'S WE PRACTICED OUR new sign language. Ma drove so slowly that all the trucks had to pass us, and as they did we yanked furiously at the air. They honked. There was not one exception. Enormous men honked twice and waved sausage-like arms at us; scrawny men with few teeth blew long bugle sounds; handsome moustachioed men like the men in cigarette commercials honked quickly and swooped ahead of us and off. Their sounds carried us along the parkway. Audie perched on the seat back and waved like a politician in a parade. My hat shimmered beside me, my hair flew out in back. New York blew by and out to sea on a chorus of truck horns, and we waved to Yonkers, to Westchester, to Valhalla, with graves stretching for miles, until we crossed into Connecticut and everything became perfect green. Jack Cirillo lived on Long Island Sound. We could see the water well before we arrived, always appearing and receding, more a swamp than a sea. He had a dock and a boat, so his children could explore the salt marshes when they visited. And a family of swans living on the water in back of the house, Ma said.

Jack Cirillo, when he came out to meet us, walked casually, spoke slowly, and deeply, as if he had a pleasant and private idea beneath everything he said. Ma had been

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combing her hair and passed me the comb under her hand. I arranged my hat and she pushed my hair back beneath it, off my face. Jack Cirillo kissed my mother's mouth, but quickly, and Audie glanced at me for confirmation. I didn't care if she was having an affair with him; or, more exactly, I hoped it was true. I liked the way his watchband gripped his wrist; I liked the dark hair curling at the opening of his shirt. Jack Cirillo shook Audie's hand and patted her head, admiring her tattoo, shook my hand and kissed me lightly, beside my eye.

"This is too much," he said to my mother. "God knows what people are going to think I'm keeping over here. You've got a built-in entourage."

Ma smiled, lifting her chin. "And you deserve one," he added.

We went directly to the back yard, where Jack Cirillo brought out two pitchers of lemonade, a green plastic one for us and a smaller glass one, which he set down by the chairs at a distant corner of the lawn. A bottle of gin already rested on one of the chairs.

"Jack and I have to talk about theater business," Ma said. "You girls can explore, but don't leave the property, and don't bother us. We need to concentrate on this." He poured out drinks and they sat down.

THE DOCK WAS TWO BEAMS JAMMED INTO THE BANK, and the boat was a rowboat, but the swans were wonderful. They drifted like lilies along the surface of the water, luminous and imposing. If I could touch them, I thought, I would find them soft but resilient, yielding only slightly to the pressure of my hand against the peaks and valleys of their forms. Audie took off her shoes and climbed into the rowboat. Every time she stretched her arm out toward the swans, the ribbons that were meant to tie the neck of her dress trailed farther into the water.

"Let's row out to the swans," she said.

"We don't have oars. We have to stay at the dock," I told her.

"Well, let's pretend we're rowing. Come on, Kate, you sit on the front seat. Look," she said to me as I tried to keep my balance and my hat, stepping into the boat, "they're putting on a show for us."

They were weaving patterns around each other, bobbing just beyond our reach as we cooed and kissed at them, splashed water to catch the rainbows in it, tossed them knotted grasses, which they refused even to examine. I wrapped Audie's sodden ribbon around my neck, but it didn't keep me cool for long. The sun was reaching into us, and I could feel myself losing my will against it. I wanted to stretch over the edge of the boat and arch my back up into the warmth. Audie was quiet, staring abstractedly across the water. On land, my mother's legs were drawn up beneath her. With one arm around them, she rested her head against the chair and laughed. Two things sparkled: the gin he poured into her glass, and her eyeglasses, dangling from her left hand, unused. She watched him through narrowed eyes.

"I'm so hot I think I'm going to melt," I said. "I'm *so* glad I'm not all covered with feathers."

"They're comfortable," Audie said. "They're half in the water. If you want to cool off you should just dip your head in."

I did. I leaned way over the side and watched my hair spread out along the water as I lowered my face into it. Then I squeezed the water out of my hair and forced it down the back of my neck. I thought it would cool my blood with every pulse. My head was finally clear.

"Now your hair's going to dry all frizzy," Audie said. "I'm exhausted. How much longer are they going to talk?"

"I don't know. I'm starving."

"I think the swans are swimming out to sea." Audie pointed to them, receding against the low green water. "They're too delicate! They'll break up on the waves. Come back, come back!" she called to them. "Maybe we could feed them." She got out and ran up the lawn. Jack Cirillo had left a plate of crackers on the picnic table for us. Neither he nor my mother turned to look as she ran back to the boat.

"Be careful," I told her. "They bite."

The idea was ludicrous, as if dancers were to step off the stage and pinch their audience; the swans moved guilelessly along the very surface of the water beyond her reach. But she reached farther, balancing her way out to the end of the dock and scattering broken crackers in front of her. They noticed. It was the first reaction I had seen. The younger, or smaller, swan circled and returned, bending its head to the water, coming up beneath the cracker, swallowing it in a single gulp. Audie crowed. "Look, it loves my crackers!" She held one out and the swan came toward her, stretching its neck. The two others followed.

"They like me," Audie said. "These crackers are good."

She ran back along the dock to the edge of the water. "Come here, little swan," she called.

As the swan floated toward the upheld cracker I could see it was not little at all; although it was the smallest of the three, it was nearly the size of a large wedding cake. It gave the appearance of nonchalance, drifting as if the current had shifted in our direction. The older swans followed it. Suddenly I was envious of Audie, who could persuade reasonless creatures to stretch toward her. The little one straightened its neck, lifting its head up to her hand. I leaned back against the rim of the boat. Under the arc of Audie's outstretched arm I could see my mother nod her head, making a point.

"Look," Audie said, "the mother wants a cracker too!"

It was true. The largest of the swans had zoomed into position under her arm, pushing the baby away. I was

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amazed at its sudden energy. It reached up closer and closer to her hand.

"Kate, look!" she called, but the creature ignored the cracker altogether and clamped onto her hand. The cracker fell. Audie yelped and pushed back away from the water and the swan. The malevolent wedding cake popped to the shore in a second, squawking as if Audie had bitten it. Ma was on her feet, I was on my feet, rocking the boat, and Audie—poor Audie—was running, as awkwardly and as fast as the pursuing swan. It seemed a real bird now, like a gigantic chicken.

"Just run straight up the lawn!" Ma shouted. Audie did, and the swan followed her to some invisible human boundary, turned, and stumbled back to the water. My mother, like a mother swan, took Audie in. Jack Cirillo seemed suddenly out of place. He poured a glass of lemonade for Audie, held it out to her, poured gin into it. I saw this as I walked up the lawn to them. Breathing loudly, tossing back the gin with emphasis, Audie handed me a barrette.

"Put your hair up in this," she whispered. "It looks terrible."

"I told you they'd bite you," I said. I tried to pull my hair into some kind of order, twisting and pinning it so I could feel it drawn from my face like a curtain. "You're lucky they didn't drag you off to a watery grave," I said.

Ma was laughing softly, helplessly.

"Do they make a practice of this?" she asked Jack Cirillo. "Can you sic them on burglars?"

"I swear I've never seen it before," he said. "Usually they ignore people altogether."

"I wish *I* could have seen it too," Audie said. She raised her arms and collapsed lightly to the ground.

"She has a flair for comedy," my mother explained.

Jack Cirillo laughed a quiet inward laugh. He was surveying us, I thought, as if we were a flock of some kind, similar in our motley attitudes, clipping at our feathers, shifting our weight. I could feel Audie's barrette begin to slip in my hair, and my mother said that we should leave.

"But I haven't had a chance to talk to your daughters," he said.

"Jack, I can't stay. You know the situation. He's already furious. And now I've got this car that God only knows if it works or what. I'll bring the girls again sometime."

"Will they still be as pretty as this?"

My mother showed some surprise. She looked at each of us for a moment, almost involuntarily, and back to him, smiling. "They may be prettier. Audie probably won't have that tattoo anymore."

"I'll always have this tattoo," Audie said. "I'm gonna have this *really* tattooed on both my arms."

"*And*," Ma said, "Kate will have a neater hairdo. She will have given up the Irish washerwoman look."

I was stricken. I had expected the barrette to please her. Jack Cirillo extended his hand and tucked a loose strand of my hair back, running his finger slowly around my ear.

"I like this look," he said. "This look was very popular when I was in France." He watched me with such intensity I could not believe he was really seeing me, and his hand returned to my head. "Remove one pin, and her hair will be all over the pillow," he said.

No one spoke. The swans were back on the water, gliding peacefully past each other. The sun was still hot, hot, and I stood in the heavy air under the light press of Jack Cirillo's hand.

"Jack," my mother said finally, half angrily, "you are absolutely impossible." Her own smile seemed slowed by the sun.

In the car, my mother seemed older to me. Audie raised her arm, signaling a truck driver to honk, but Ma said the

FLOOD

If you stare out over the waters
on a bright day when the wind is down
and the waters move only to groom
themselves, turning their beautiful faces
a little to guess how the light looks
on them this way, and that. . . .

If you hear them, contented as they seem
to be, and quiet, so that they seethe,
like a slow fire, and their long syllable
is not broken into music. . . .

And if you should carry them with you
like the memory of impossible errands
and not know what you carry, nor how,
so that you feel inelevably mute,
as if from birth, then you will be apt
for speech, for books, and you'll be glib

though it torment you, and you'll rise
to the sacraments of memory and lie down
unable to forget what you can't name,
and the wine in your glass will be ink.

—*William Matthews*

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noise was giving her a headache. I smoothed my hands down over the front of my dress and stretched my arms out. From the back of my hair I pulled the one pin. My new green straw hat lay beside me. I arranged it on my head.

"You're going to lose that hat," my mother said.

"It fits me perfectly," I told her. "It's very snug on my head." She was driving faster than usual, perhaps anxious to get home to my father's imagined wrath. In the back, Audie was quiet, even subdued. She rested her head against the seat; her skin was reddening in the wind. Across the dividing strip of lawn, a very few cars headed toward New York against the sun. Connecticut was an expanse of lawn and low trees, hazy and leafy, the light so strong at this slant that I felt subsumed, pressed by the light as if it were moisture in the air. I suppose it seemed that force would keep my hat on in the wind, but at the first sweeping curve I felt it lift off my head. I wasn't immediately regretful; as I saw it roll off, its silvery green straw in the brighter green at the edge of the highway, I thought, Now I know why they call it a bowler, but Audie yelled, "Katie, your hat!"

"Ma, my hat's gone!" For the first time I wondered if she could hear me over the highway sounds. "It blew away!" How blessed were the drivers across the highway, speeding toward my hat! I felt I would cry.

"We can't get back there," Ma said. Her voice rose in annoyance. "I *told* you to take it off," she said. "It's ten miles to the turnoff, and we couldn't just stop on the highway, even if we did find it. It's probably already been run over anyway." Now I thought she would cry. "*Why* did you have to wear it, all of a sudden? Nobody can see you now."

"It's your own fault, Katie," Audie said.

"Well, don't make her feel any worse about it," Ma said.

I couldn't have felt any worse about it. I knew how childish it would be to cry over a lost hat, so I closed my eyes and tried to forget it. I tried to think of my zoot car, but it seemed merely an accessory to the loss of my hat. I tried to think of the swan chasing Audie, but I thought of Jack Cirillo, until I could remember exactly his slow voice and his slow touch and the slow rise of my blood as he spoke to me. I gave in to the memory, remembering the scent of Audie's flowers, the heat reflecting off the water as we rested at the dock, the water so substantial that the swans seemed weightless even as their bodies pressed into it, even as it rose to meet their weight. Ma had slowed the car, and I heard the sound of each car that passed us, like the sound of scythes, one after the other, cutting through the air. Then I heard a siren.

"I'm only going forty miles an hour. They can't want *me*," my mother said. The car pulled beside us. "My God," Ma said, "this car *is* hot."

But the policeman was smiling. "Did any of you ladies lose a hat?" he asked.

"Me!" I said. "I did." He produced it, in perfect condition. To my mother, he said, "You shouldn't drive so slowly on this highway, ma'am. It can cause an accident, when you get so many vehicles built up behind you." He was plump and blue-eyed and exasperated, as if his days were overfull with time spent chasing cars full of deciduous women, shedding their hats and scarves in the wind.

"Officer, I'm sorry," my mother said. "I'm not used to driving this car yet and I'm afraid if I press the accelerator too hard it'll just shoot out from under us. And I get so nervous driving in traffic I just think it's better to be on the safe side. But I'll try to drive faster now, because I don't want to cause an accident."

He stepped back. "Well, it's your business. It's just a suggestion," he said. "Have a nice day, now. And keep hold of that hat."

"I will," I said. I smiled my mother's smile at him, reached out to touch his arm. "Thank you so much." My mother stepped on the gas and we were off like a shot.

"I'd like a pair of driving gloves," she said to me. "Brown and beige, to match the car."

"We'll each get a pair," I told her.

"I'm not sure they make them in children's sizes," Ma said, smiling. I stretched my hands out in front of me. They were slender, strong, and against the dashboard they showed a pale, almost luminous, shade of white. They were not the hands of a child, but I didn't say that to Ma. In a week I would have my driver's license. I pressed the leather of the seat; it felt perfectly resilient, rising up against my hand. I could hear the engine shift to a higher gear and I could feel the smoothness, the power, of the new speed. I wanted to tell someone that this was my car. I wanted to tell my mother that I *loved* my car, but I decided not to. Instead, I tucked a strand of hair slowly behind my ear.

In the back seat, Audie crooked her elbow and pulled an imaginary horn, but no truck answered. There were none on the highway.

"Beep beep," I said.

"Honk, *hooonk*," said my mother, imitating swans. "You were so funny, Audie, running from that swan." She reached back over the seat and Audie squeezed her hand.

"We have to make a plan to cheer your father up later," Ma said.

"He'll probably be happy enough to see we aren't in jail," I told her.

"He should be," Audie said. "We're incorrigible."

She was right. We turned off the highway, past the bright, destructible gardens of Connecticut that lined the road home. □

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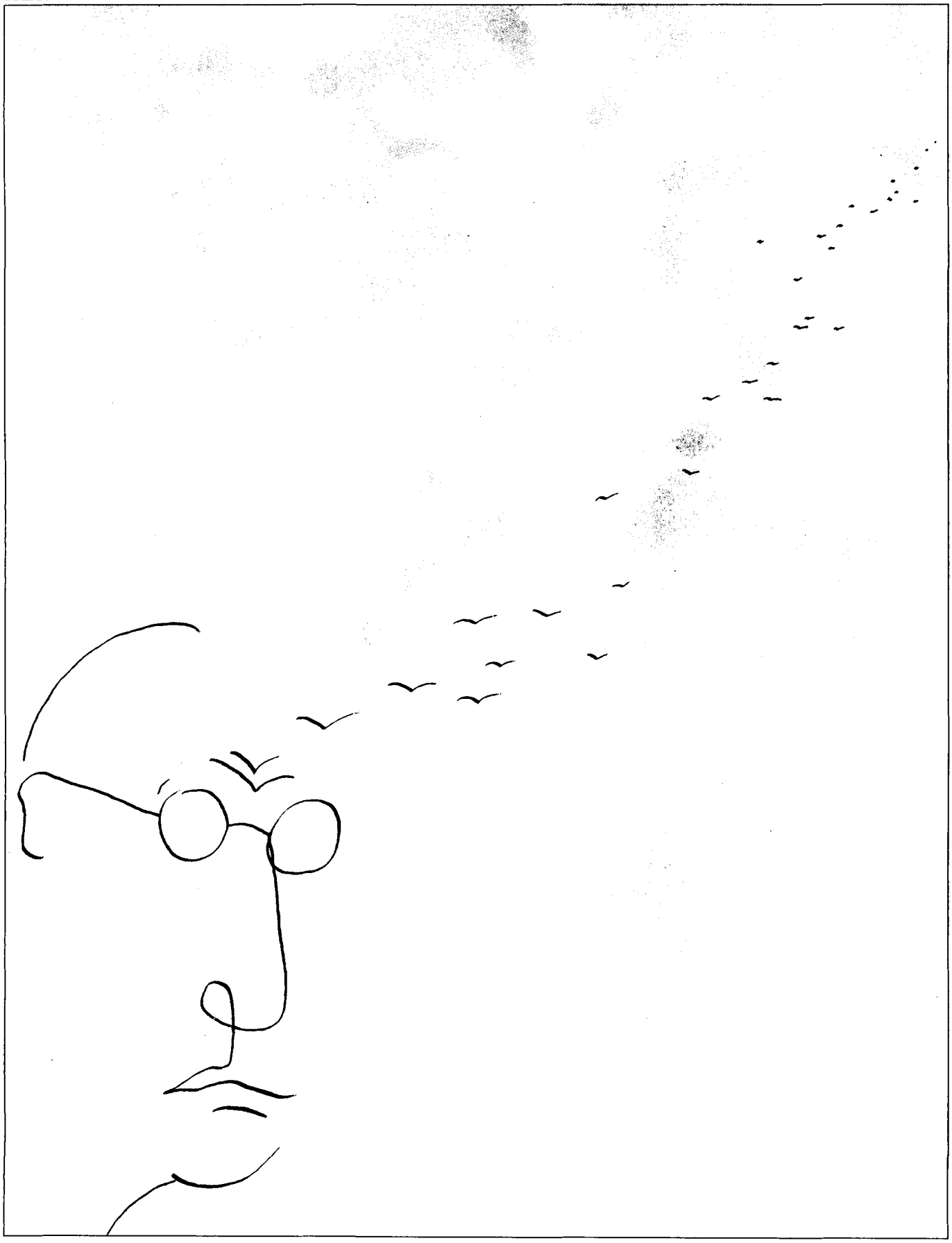
AERIE

BY MICHAEL CRAWFORD



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The trend is toward increased production, not famine

WORLD FOOD SUPPLIES

BY JULIAN L. SIMON

THE PREDICTION THAT FOOD PRODUCTION CANNOT KEEP up with population growth has been made repeatedly for more than a decade. For example, in 1968, Paul Ehrlich declared in his best-selling book *The Population Bomb* that "the battle to feed all humanity is over. In the 1970's the world will undergo famines—hundreds of millions of people are going to starve to death." In 1975, the United Nations Economic and Social Commission for Asia and the Pacific predicted "500 million starvation deaths in Asia between 1980 and 2025." The following year, the head of the United Nations Food and Agriculture Organization (UNFAO), Edouard Saoma, described the long-term prospects for food production in developing countries as "alarmingly inadequate." In 1975, a full-page advertisement sponsored by the Environmental Fund appeared in leading newspapers. It stated:

> The world as we know it will likely be ruined before the year 2,000 and the reason for this will be its inhabitants' failure to comprehend two facts. These facts are:
>
> 1. World food production cannot keep pace with the galloping growth of population.
>
> 2. "Family planning" cannot and will not, in the foreseeable future, check this runaway growth.

The ad was signed by Isaac Asimov, Zbigniew Brzezinski, Malcolm Cowley, Paul Ehrlich, Clifton Fadiman, J. Paul Getty, Henry Luce III, Archibald MacLeish, Albert Szent-Gyorgyi, DeWitt Wallace, and Leonard Woodcock, among others.

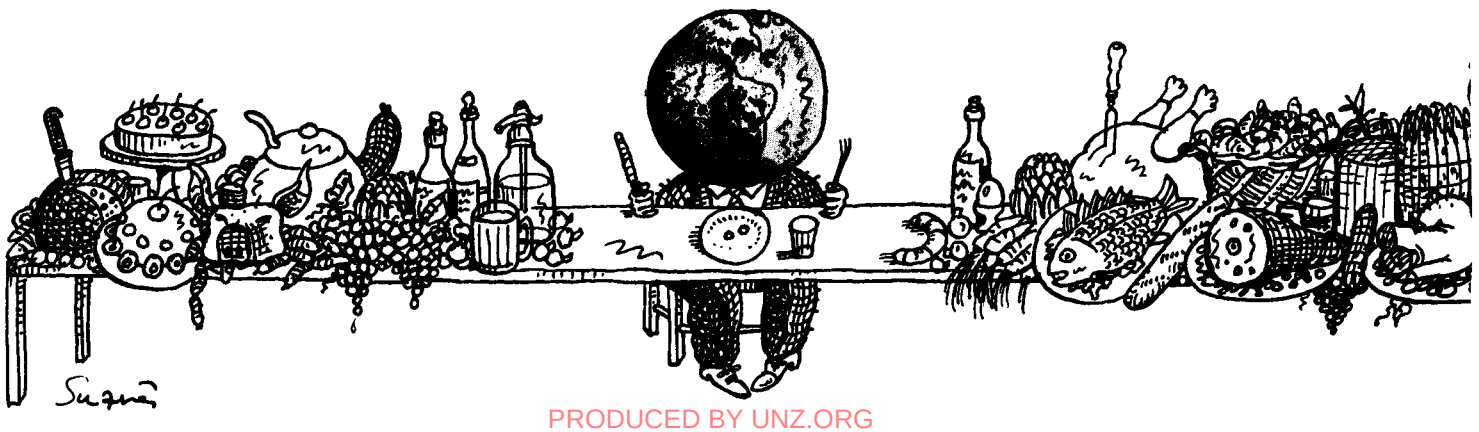
Over the past ten years, such pronouncements have multiplied; they seem now to be regarded as facts of life rather than as conjectures. Some people see in these assertions a warrant for triage: the policy of abandoning the least fit in order to concentrate on victims who have a decent chance of surviving. A book by William and Paul Paddock, *Famine—1975!*, applied this wartime medical concept to food aid and produced the following judgments:

Haiti	Can't-be-saved
Egypt	Can't-be-saved
The Gambia	Walking Wounded
Tunisia	Should Receive Food
Libya	Walking Wounded
India	Can't-be-saved
Pakistan	Should Receive Food

A more severe version of triage is the "lifeboat ethic," proposed by the biologist Garrett Hardin (see "A Conversation with Garrett Hardin," by Harold Hayes, May *Atlantic*). Hardin argues against giving food to starving people, on the grounds that such aid abets population growth, which will leave future generations worse off.

Despite the popular consensus, buttressed by scientists of various disciplines, that the world is heading toward agricultural ruin, the view of mainstream agricultural economists is quite the contrary. It is an accepted idea among agricultural economists that the trend—as revealed in recent decades by statistics and in the more distant past by historical evidence—has been toward improvement in the food supplies of almost every main population group. For example, in 1973, even before the

Julian Simon is a professor of economics and business administration at the University of Illinois, Champaign-Urbana, and is the author of Economics and Population Growth. *The material in this article will appear, in somewhat different form, in Mr. Simon's book* The Ultimate Resource, *which will be published by Princeton University Press.*



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recent years of bumper harvests, D. Gale Johnson, who teaches agricultural economics at the University of Chicago, told the American Statistical Association that food supply had increased at least enough to match population growth in developing countries for four decades. He discerned a gradual improvement in per capita food consumption for the past two centuries.

THE PRINCIPAL EVIDENCE FOR OPTIMISM IS THE RECORD of food production, as represented by data collected by the UNFAO from member countries and by the U.S. Department of Agriculture from 104 countries and from American agricultural attachés.

Production of food (as measured by food's adjusted value on the market in a given year, divided by the world population) was either 28 percent or 37 percent higher in 1979 than in the 1948–1952 base period, according to the UNFAO and the USDA, respectively. The difference arises partly from the inclusion of China in the UNFAO figures, and in any case does not qualify the direction of the trend.

Although the two statistical indexes are far less reliable than one would like (economic data usually are), they are all that we have. Numbers that show a worsening trend in recent decades simply do not exist. Nevertheless, people resolutely ignore this silver lining and instead try to find the cloud. Consider, for example, this statement from an article by two demographers in the journal *Population and Development Review*: "During the last 25 years or so the average annual rate of increase of world food production has steadily deteriorated. . . . it fell from 3.1 percent in the 1950's to 2.8 percent in the 1960's and 2.2 percent in the first half of the 1970's." I shall leave aside the large question of whether such apparent changes are statistically meaningful. What is interesting for now is the word "deteriorated," which suggests that the world food situation is getting worse. But the data tell us only that the gain—the *improvement*—was greater in the 1950s than it was later; they *don't* say that food production is not increasing.

Similarly, *Business Week* ran an article on food and illustrated it with a bar graph, comparing population with food per capita from 1954 to 1974. It seems at first glance to show population growing faster than food. That would mean a fall in food per capita, which would be a bad sign. But on close inspection we see that food per capita has increased—a good sign. It makes no sense to put a total figure (population) next to a per capita figure (food per capita). Why is it done? People apparently want to believe and to tell others that world food supplies are running out even though—statistically, at least—they are improving.

THE INCIDENCE OF FAMINE IS A USEFUL CLUE TO changes in the world's food supply over the years. Famine is hard to define and measure, however, because when nutrition is poor many people die of diseases and not directly of starvation. Historical studies therefore count as a famine any event that people living in a particular time referred to as such.

According to Johnson, who has surveyed the documentary history of famine and reports the result in his monograph *World Food Problems and Prospects* (1973), "It is highly unlikely that the famine-caused deaths [in the third quarter of the twentieth century] equal a tenth of [those for] the period 75 years earlier." He says that "there has not been a major famine, such as visited China and India in the past, during the past quarter century," and he considers the food supply "far more secure for poor people during the past quarter century than at any other comparable period in the last two or three centuries." Johnson states that many, if not most, of the 12 to 15 million famine deaths that have occurred in this century "were due to deliberate governmental policy, official mismanagement, or war and not to serious crop failure."

Accounts such as this by Johnson are not often mentioned in newspapers or in conversation. Instead, one hears the claim that "a lifetime of malnutrition and actual hunger is the lot of at least two thirds of mankind," first made by the director of the UNFAO in 1950. Unlike Johnson's assertions, this claim is not based on any data. The UN later reduced its estimate of people in "actual

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hunger" to between 10 and 15 percent of mankind. Even though the original UNFAO estimate was a guess, a great deal of research into minimum, or satisfactory, dietary needs, and the diets customary in various countries, has now been done, and disproves it. But the statement comes back again and again in popular discussion as evidence that food is not becoming more plentiful.

People say that "the death of a single human being from starvation is an unspeakable human tragedy." This sentiment implies that even if the food supply is improving, the world's population should be reduced so that no person will die from starvation. But, paradoxically, a greater population density seems to diminish the chance of famine. The concentration of population encourages improvements in roads and transportation, and transportation is the key to preventing starvation when crops fail.

The Sahel in Africa is a good example. A reporter for *Newsweek* posted this dispatch in 1972, during the severe drought:

> "Sure, the food is pouring in," observed British Red Cross liaison officer George Bolton, "but how the hell are we going to get it to the people who need it? There isn't a tarred road within a thousand miles of Juba." Bolton wasn't exaggerating. While I was in Juba, I witnessed the arrival of 5,000 gallons of cooking oil, which had been diverted from the nearby state of Rwanda. Since the rickety old ferry was not strong enough to carry the oil shipment across the White Nile so it could be distributed to the needy in the interior, the oil was promptly unloaded on the riverbank and stored in Juba.
>
> And this was not an isolated incident. I saw warehouses in Juba overflowing with millet, dried fish, cooking utensils, agricultural tools and medical supplies—all useless because nothing could be delivered to the people who needed it.

The Sahel is a case study of food, population, and public relations. Later we read in *Newsweek* (September 19, 1977) that "more than 100,000 West Africans perished of hunger" in the Sahel between 1968 and 1973 because of drought. Peter Gwynne, a *Newsweek* editor, informed me that the estimate came from Kurt Waldheim's message to the UN Desertification Conference, in 1977. Waldheim had said, "Who can forget the horror of millions of men, women, and children starving, with more than 100,000 dying, because of an ecological calamity that turned grazing land and farms into bleak desert?" When I queried Waldheim for his source, I received a two-page excerpt from a memo by the UN Sahelian Office, dated November 8, 1974, saying, "It is not possible to calculate the present and future impact of this tragedy, on the populations. . . . Although precise figures are not available, indeed unobtainable . . . certainly there has been an extensive and tragic loss of life. . . ." Also enclosed was a one-page memo written specifically for the UN in 1975, by Helen Ware, an Australian specialist in African demography who was at that time a visiting fellow at the University of Ibadan. Ware calculated the normal death rate for the area, together with "the highest death rate in any group of nomads" during the drought. She figured that "at an absolute, and most improbable, upper limit a hundred thousand people who would not otherwise have died, succumbed to the effects of famine. . . . Even as a maximum [this estimate] represents an unreal limit."

Ware's figures, which cast considerable doubt on Waldheim's confident assertion, were on the first page of a document written for and sent out by the UN before the Desertification Conference was held and Waldheim's message was publicized. It seems to have been the only calculation the UN had. In a letter to me, Ware said: "The problem with deaths in the Sahel is precisely that there was so little evidence of them. . . ." A recent summary of the scientific evidence on the drought's effects by John Caldwell, a demographer who was familiar with the area prior to the drought and who lived there in 1973, echoes Ware's skepticism. Caldwell reports, "One cannot certainly identify the existence of the drought in the vital statistics. . . . nutritional levels, although poor, were similar to those found before the drought in other parts of Africa. The only possible exception was that of very young children."

The UN retreated in 1978 to the more modest but still unprovable assertion that "tens of thousands" died. But last July, the estimate was revised upward again when the UN announced (as reported by the Associated Press) that a forthcoming "permanent food crisis . . . will be deeper than the 1972-74 drought, when 300,000 or more died in Ethiopia and the Sahel belt south of the Sahara."

To question the accuracy of the number of dead people in the Sahel may seem heartless, but the number is important: if it exaggerates the magnitude of the problem, we may despair of any solution. Undoubtedly a drought did occur in the Sahel, crops failed, people suffered, and some died. But to suggest that one crop failure was more severe than it was, and that another will be permanent, as the UN has done, is likely to convince us that there is no hope.

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SINCE GLOBAL TRENDS OF FOOD PRODUCTION CAN MASK exceptions, let us consider two countries where food has been short: India and Bangladesh.

Net food grain availability—the amount available for human consumption—in kilograms per capita per year has been rising in India since at least 1950-1951. Throughout the 1970s, food production increased at a faster rate than population. Why has India's food supply improved so dramatically? The cause is not an agronomic miracle but an expectable economic event. Most price controls on food were lifted, and price supports were substituted for the controls. Indian farmers had a greater incentive to produce more, so they did. They increased production by planting more crops a year, on more land, and by improving the land they had. They also introduced higher-yield strains and improved fertilizers.

Some people are surprised that Indian farmers could find more land to cultivate. But in fact the total area of Indian cultivated land increased by about 20 percent between 1951 and 1971. In addition, there was a 25 percent increase in irrigated land between 1949-1950 and 1960-1961, and another 39 percent increase between 1961-1965 and 1978.

When Bangladesh became independent, in late 1971, after a devastating war, Henry Kissinger called the country "an international basket case." Since then, the food supply has at times been so low that some writers have advocated "letting Bangladesh go down the drain," whatever that means. Other people organized emergency relief operations. But production began to improve in 1975 and has continued to improve steadily over the years. From 1975 to 1980, Bangladesh's population increased at a rate of 2.7 percent; its food-grain production increased at a rate of 4 percent.

Nevertheless, even though half of the cultivated 22 million acres are suitable for two crops at a time, and some for three, yields per acre remain low. Only 3.4 million acres are irrigated, and there is no strong incentive to increase that amount. Storage capacity in Bangladesh is limited, and about 75 percent of the farms produce for subsistence rather than for the market.

Why would a subsistence farmer grow more than his family can eat? An urban housewife does not buy so many vegetables for the week that they spoil. Malthus spoke of a "natural want of will on the part of mankind to make efforts for the increase of food beyond what they could possibly consume." Food is produced to meet demand, either of subsistence-farming families or of the market. When demand increases, farmers are encouraged to find ways to produce more crops and improve the land.

Food, like other resources, is a market commodity. Wherever it is bought and sold, the most sensible measure of scarcity is price (and the cost of production, which is close to price over the long term). But we must keep in mind that price does not tell us everything about scarcity and social welfare. A product may be readily available, as measured by its low price, and there may still be social damage. For example, a daily ration of vitamin A may be cheap, but if people can't find a store that sells vitamin A, or if they don't believe they need it, then their health is nonetheless jeopardized. On the other hand, caviar may be expensive and scarce, but the lack of caviar has no effect on society's well-being. The price of a week's groceries may be higher now than in a previous year, but there is no harm to society if income also increases. Therefore, though the price of food and the social welfare are often connected, they are not identical.

In this country, the sharp rise in food prices in 1972-1973 was interpreted by many consumers as the harbinger of an increasing scarcity of food. But the trend in food prices over the long term justifies a more cheerful attitude. Because wheat is important in the diets of so many countries, and because its price tends to move in concert with the prices of other grains, it is an important indicator of world food supplies generally. And U.S. export prices for food grains are reasonably representative of world-market prices. Since 1800, the price of wheat relative to wages has fallen sixfold. Relative to an estimated Consumer Price Index over the same period, it has fallen by more than a third. From this point of view, the abrupt price jump that took place in the 1970s is seen to be one of many fluctuations that have occurred in the midst of steady decline.

The decline in wheat prices is hard to believe, especially when one considers the great increase in demand resulting from world population increases and world income increases. But production increased even more—enough to overcome these pressures and keep the price down. There is no reason to assume that the future will not be continuous with the past. Thus, from the historical trend toward cheaper and more plentiful food, it is reasonable to conclude that real prices for food will continue to drop as food becomes more abundant.

POPULATION GROWTH HAS RAISED THE SPECTER OF increased pressure on the land. More people, it is said, make for smaller farms per farmer, and hence a harder struggle to produce enough to eat, until each of us is scratching out three skimpy meals from eighteen hours' work a day, on a plot the size of a window box. "More people, less land," the Environmental Fund says.

More people, it is further said, will ruin land, especially in arid areas. *Smithsonian* magazine has editorialized that in the desert, "traditional, more primitive agricultural techniques using natural ecological cycles are all that will work . . . and *that means small populations.*" The head of the Population/Food Fund, Charles M. Cargille, M.D., writes that "overpopulation contributes to . . . deforestation and agricultural practices damaging to soil fertility."

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Yet the world now eats as well as, or better than, it did in earlier centuries—even in poor countries. This paradox is explained as follows: Reduction in the amount of land available to the farmer causes little hardship if previously he did not need to farm all the land that was available to him. (However, he may have to change his methods so as to cultivate the land more intensively.) Furthermore, when farmers need more land they make more land. They build land for cultivation by investing their energy, blood, money, and ingenuity in it. The increase in agricultural output as population rises (with or without an accompanying rise in income) has been accomplished, in most countries, largely by increases in the amount of land farmed.

The late Joginder Kumar, a demographer, did an enormous amount of hard work to collect and standardize data on land supply and use throughout the world. The results are reported in his book *Population and Land in World Agriculture* (1973). Kumar's finding: There was 9 percent more arable land in 1960 than in 1950 in the eighty-seven countries for which he could find data; these countries account for 73 percent of the world's total land area. Some of the places where the quantity of cultivated land is increasing are surprising—India, for example, where the amount of cultivated land rose from 1,261,001 to 1,379,190 square kilometers between 1951 and 1960.

The trend that Kumar found from 1950 to 1960 continues. The UNFAO has collected data back to the 1960s showing that there was a rise in "arable and permanent cropland" from 1,394 to 1,506 million hectares in the world as a whole between 1961–1965 and 1975, an increase of 8 percent. In the developing countries the gain is particularly significant and encouraging.

The fact that the amount of arable land in the world is increasing does not forebode diminishing returns in the long run, with successively poorer land being brought into use, because it is also a fact that average yields per acre are increasing. Improvements in yield per acre and total production can be so great that farmers cultivate less land. Such was the case in the United States, for example, until the 1970s.

In this country, surplus production has been the problem. The high output has been obtained in large part with huge farm machines that require flat land for efficiency. This combination of increased productivity per acre of good land and increased use of equipment adapted to flat land has made it unprofitable to farm some land that formerly was cultivated. For example, between 1860 and 1974, the tillable area in New Hampshire declined from 2,367,000 acres to 172,000 acres. Although yields have continued to increase in the U.S., world demand and changes in government agricultural policies were incentives for farmers to increase their acreage over the last decade. Not only is more pasture and fallow land being cropped now but also new cropland is being created at the rate of 1.25 (or, according to another estimate, 1.7) million acres a year, by irrigation, swamp drainage, and other means. This is a much larger quantity of land than the amount converted to cities and highways each year.

There are places where, for unhappy reasons—usually wars or fights about land tenure—good land that was once cultivated is fallow: Mexico, for example. In the mid-1970s, Mexican peasants, frustrated by the slow pace of agrarian reform, began seizing land. The big estates then cut their investments in fear of more seizures.

The potential for creating new land has increased as knowledge, machinery, and power sources have improved. At one time, most of Europe could not be planted, because the soils were "too heavy." When a plow that could farm the heavy soil was invented, much of Europe suddenly became arable in the eyes of the people who lived there. Most of Ireland and New England were once too hilly and stony for farming, but with effort the stones were removed and the land became "suitable for crops." Now this land is again not worth cropping and has been turned to other uses. In the twentieth century, bulldozers and dynamite have cleared out stumps that kept land from being plowed. And in the future, cheap transportation and desalination may transform what are now deserts into arable lands. The definition of "arable" changes as technology develops and the demand for land rises. Hence any calculation of "arable" land should be seen for what it is—a rough estimate without permanent force.

Experts and laymen alike continue to state the "obvious" (though incorrect) view that there is a limit on the amount of food in the world, and that if some countries consume more, others in need will have less. What I have tried to demonstrate here is that food has no long-run, physical limit. This does not mean that complacency about the food supply is in order. Droughts and famines occur; in some countries, even under ordinary circumstances, some people don't have enough to eat. But these conditions are not inevitable; they are rarely permanent. I believe that, with effort and with confidence, they can be reversed. □

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DON'T TOUCH THAT DIAL

BY ROBERT M. STROZIER

ILLUSTRATIONS BY PHYLLIS HERFIELD

HI. WELCOME TO our show. Aren't you nice. How is everybody today? We have a great lineup for you. Coming up is Dr. Artie. He'll fill out a prescription. Then a taste of Long Island on Long Island. Mitchell Farnsworth, who is lawless, talks about all of it that he does. How would you like to have as much sex as you could get? One woman did. She's here with her story. Just ahead, when we continue.

We're back, live. Joining me now is someone who is kind of funny-looking. Ladies and gentlemen, please say hello to Leona Baxter. Leona, how's the weather up there? Just kidding; I bet people say that to you all the time. Thanks for being with us today, dear. He was the leader of a people. She was Miss Louisiana. Her best friend was a brash voodoo cultist. The saga of them, which sweeps all before it, will shock, disturb, and unsettle you. Tomorrow, on *Million-Dollar Program.* Then, on *Full-Figured Gals,* Cindi goes braless to church, wearing a sassy waitress's outfit, and Dad throws a fit. We're fine at nine.

What's hot, what's not? Also, don't miss these ones: *Firing Line, Nightline, Sportsline, Healthline, Consumerline, Dateline, Byline, Lineline, The Facts of Life, The Brady Bunch, The Brady Brides, The Brady Brides' Bunch, Eight Is Too Many, Good-bye, Larry,* and many more others.

Now, let's play "Let's Play." Born in Akron originally, he now makes his home in Akron. Welcome Akron's own—Willis Bedford. Come on down, Willis, and then come up, and then come over with me to the big board to meet Ginger Hoyt, back to do battle. Before we continue, kiss me on the lips, Ginger. I've always liked that dress. You've elected to spin the wheel, play potluck pix, block the dragon, diddle the devil, bid part of your mud dauber outfit, and vie for a date with Willis. The card, Connie. Ginger, what part of Willis is white and round and dimpled? In just a minute, the producer of this show will explain how he makes it all come together. Wrong, Ginger, but milady goes away with a lot of money and promotional considerations. That's nothing to sneer at. It's better than a poke in the eye, Ginger. The contestants and your host were selected in advance. We'll be back when we return.

Coming up: *The Wide World of So Many Goings On.* Segments include segments on airplane graffiti; a man who juggles midgets; shopping for the right surrogate mother; a tribe that eats pajamas; gurus who strip for cash; solar interior decorating; a soft sucker who works a hard town; some women who like to dress up as Eisenhower, which is socially acceptable; a fatty-acids diet; snails that clean your back where you can't reach; a new TV headset that you can plug into your eyes; the atoll that time forgot, populated by warring, brawling, and romancing predators; a woman who got lost in the sex-clinic shuffle and waited for the call that never came; to name just some of how many there are. We'll be back, after this word and another one.

From Television City, here now, another part. Welcome actress Pippi Ramesh, who's cooking some food for us. Pippi, I notice that you use ingredients in all your dishes. On board is Marian Forbes, author of *It Was Good For Me,* who will outline a program for self-pleasuring. Pippi, do you extrude your own pasta? Someone could take that two ways, couldn't they, studio audience? Greet a good friend and a song's best friend—Barney Evans. He is a giant in our business. He is short on stature but tall on talent. He paid his dues. He did it until he got it right. He can hit any ball this town can throw. Barney, you have recently come out of, and then gone back into, an elongated career slump and depression-induced depression that has been terrible for you. People don't see much of Barney Evans anymore. Where has Barney Evans been, Barney? Give examples.

Robert M. Strozier is an essayist and an avid television viewer.

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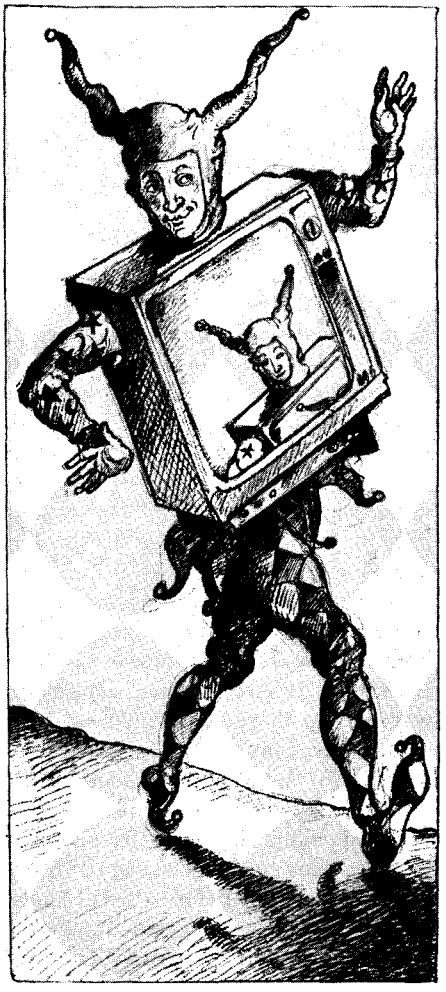
This program is being videotaped earlier.

Be sure to join us, now that we are back. Being something you can see this week are: *Romper Road.* Season's premiere. Drama, violence, power, corruption, adult situations, vulgar language, partial nudity. Pilot for a possible plot about a syndicate kingpin who shares his sleazy Hawaiian walk-up with five curvacious, lust-starved thrill-seekers, an aging closet queen, a gay border-patrol officer, a washed-up baseball chicken, and a moody make-out artist. *Joan of Arc.* Sammy Davis, Jr., stars as the little sparrow who leads a nation to victory. Includes a car chase. *Playhouse Showcase.* Action-reporter Geraldo Rivera visits a swimming pool and files a think piece about the twilight lives of men and women who bathe for love.

Butte just joined us. In addition, also will be on: *The Towering Horrible Thing.* Disaster. Earth is unwittingly caught in an off-guard moment by a vast, alien, extraterrestrial version of *Candid Camera. The Gang Show.* A gang rotates as performers and panelists, judging each other. With Paul Lynde, Marty Allen, David Doyle, Sammy Cahn, Lilias, Tiny Tim, John Ritter, Senor Wences, Charlie Callas, and Wink Martindale. (Repeat.) *Groovie Goolies.* Something. *Fantasy Island.* A person realizes his fantasy—to be Gilligan. *Hush Hush, Kiss Kiss, Kill Kill, Bleeding Bleeding.* Crime, suspense, murder, mayhem, raw emotion, sizzling footage, sentiment, gore, grisly sex. High-voltage, heartwarming, lurid, made-for-viewing TV movie about a mentally retarded baby-sitter, a lovable stray, a mutant robot, and a lame-and-halt fawn who are stalked by an unsavory homicidal maniac who learns the meaning of love from Tony Orlando, who gives a shattering performance.

Let's take some calls. But first, a Newsbreak Newsbrief Dateup Upwrap. Alternate-side-of-the-street parking has been suspended anywhere. Recapping: that is what I just told you. Coming up: an instant analysis, an answer to it, and a rerun, followed by *Masterpiece News.* Stand by, we're having transmission and origination difficulties.

I will be in the critic's corner, very soon. Dressed as a bag lady, social researcher Mandy Peterson mingled freely among the big cats at the San Diego Zoo, studying courtship signals.



Let's bring on Mandy and her special one, Skipper. Here's a helpful hint: when you buy something, make sure it's a good one. Oh, our ratings just went up nine tenths of a point. My next guests are Cyrus and Deirdre Nadler, who divorced each other and their children, who are here too. Deirdre, you say in your book, *My Divorce For You,* that you love your children almost as if they are yours. Cyrus, as I read *Distance Can Set You Free,* I was struck by what you said, which is that someone can be a more caring parent if he isn't there most of the time. Kids, in *Four Who Found a Better Way,* there are signs of a widening closeness between you. Speaking for myself and each viewer, I think you are an inspiration to all of us and to each other of you. Don't touch that dial.

Time now to take a look at the time. It's 1:10 P.M. Wednesday, an all-star cast heads up an all-star lineup on the *Celebethon Guestfest,* which I will host from Caesar's Palace and the Forum. Here's what it could be having as some of it: sketch, featuring B. J. of *M*A*S*H,* J. D. of *Concrete Cowboys,* J. J. of *Good Times,* J. R. of *Dallas,* BJ of *BJ and the Bear,* Brian Eno, Jay Leno, Victor Buono, Rita Moreno, Virginia Mayo, Cesar Romero, Monte Carlo, James Coco, Perry Como, Dino, Charo, Don Ho, Bo, and Sonny Bono. Mister Rogers sings "She's a Lady." Nureyev dances the life of Rita Jenrette. Japanese rock group, Sho Na Na, does a medley of hits from the Fujiwara period. Richard Nixon gets roasted. The Oakland Raiders and Nader's Raiders talk about what to look for in a helmet. Sergio Mendes and the Chubb Group do some informal pickin'. Halftime highlights include great moments from intercollegiate wrestling. Dr. Joyce Brothers and Wayne Dyer are inducted into the Therapy Hall of Fame. Telly's Telly Savalas salutes the telly. And the casts of *Bosom Buddies* and *Budding Bosoms* compete in the rub-a-dub-mud-in-the-tub event.

Next up: a clip from yesterday's show. For more on that, I'll set it up for you. In it, I am interviewing Stefanie Crystal, author of *Beyond the Barrier Reef: The Last Taboo.* That means a lot coming from you, Stefanie, I am saying, and then I seem to catch fire. As most of you know, I go on to remark, I first burst on the scene with my recording of "The Day My Dog Died," and from there it was a short hop to the limelight and hostdom. Watch the monitor.

WE NOW RESUME OUR regular programming schedule, already in progress. I am in person. Follow along as I read the affidavit. "My name is Mickey Pearl. Despite my short temper, I have successfully secured sexual favors for over one million men. I am known as the Pouting Procurer." Tomorrow, four former regulars on this show return for an affecting reunion. Now, more than ever, the one to watch, when you're watching the one you want to watch. Somebody else got to me first.

We just moved into prime time. If you tuned in late, I will summarize what's happened so far. First, join me in a hello for some molesters, deviates, sexually active adults, perverts, deadbeats, malefactors, sheep biters, squealers, sad sacks, and emotional cripples, wearing hoods. Students from the DeWitt Clinton High School will enact some of the things these have done. It will be painful, heartfelt, and ticklish for us. Then we'll discuss the

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dos and don'ts of doing those things, and have a tie breaker. All that, and more, of that, when we come back, with it.

That's our buzzer, meaning time is up. But we still have time for some more time. Meet Little Mo, an eleven-year-old stock analyst who is an avid disco dancer at seventy. Ahead, still ahead: *The Porn Birds, Those Incredible Hulks, Jung and the Restless, As the Dial Turns, I Really Really Love Lucy, Little House of Ill Repute on the Prairie, The Bod Squad, The Stove Top Stuffing Mix Classic, Agronsky and Hutch, The Dykes of Hazzard, To Be Announced, Let's Not Make a Deal, Drek Trek,* and *Where That Came From.* Those of you are here and at home.

Everybody up, we're going to learn the merengue. One, two, blow it out, you're still the one. Dim the lights, Sal. I want to read something that moved me to tears. "Don't skim too much off the top." Some of the dialogue today was looped. Make it one for my baby. If I were the only boy in the world, and you were the only audience.

A twenty-year ordeal came to an end for Dotty Dewberry last September when she spotted a guest on our show who owed her money. She's shown here getting off an angry letter. They're with us today. Welcome a tape of them now.

Thank you, Darlene, good ideas. It's 10:00 P.M., do you know where you are? Welcome our own, me, back. I'd like to read some mail. "Dear Sir, I love your patrician good looks. You are the cat who swallowed a wasp. You have an insinuating effect on me, loverlips. Signed, Wanda—who watches and waits." I have appeared as myself today. Circumstances are beyond our control. This was stereo simulcast on WXPR-FM. Mr. Roper, this is your life. The laugh track was by Laughtrack. I can't see the idiot card. Welcome: the Tooth Fairy, a seminal thinker, Mister Ed, the ramblin' wreck from Georgia Tech, the author of *The Problem That Won't Go Away: The Problem That Won't Go Away,* the Creeper of Ficus, the Jelly Roll King, Meshach, Shadrach, and Abednego. My wardrobe was provided by a grant from Exxon. Bye-bye, everybody. Barney, you're a loose can on the deck of life. God bless, take care. Hope you enjoyed the show. A spin-off of it follows. It went a little something, just like that. This just in. □

MUSIC

CLASSICAL RECORDS

BY WILLIAM H. YOUNGREN

IN RECENT YEARS, the canon of what we may now call classic twentieth-century music has been greatly enriched by the addition of two masterpieces long thought to have been left by their composers in hopelessly incomplete form: Mahler's Tenth Symphony and Berg's opera *Lulu.* The case of *Lulu* has, for a variety of reasons, attracted more public attention, but that of Mahler's Tenth is really more remarkable, since the Tenth's completion required far more work than did the completion of *Lulu.* The Tenth has been completed by at least three people: the late English musicologist Deryck Cooke, the English composer Joe Wheeler, and the American musicologist Clinton Carpenter. But only Cooke's version, a critical edition of which was published in 1976, has been commercially recorded: by Eugene Ormandy and the Philadelphia Orchestra in 1965 and by Wyn Morris and the New Philharmonia in 1972. Both recordings are still available (on Columbia D3S 774 and Philips 6700 067, respectively), but neither even begins to do justice to the work, and Ormandy's is of an early, inferior recension of Cooke's score. So we have had to wait all these years for the two recordings here under review: Simon Rattle's with the Bournemouth Symphony Orchestra (Angel DSB-3909) and James Levine's with the Philadelphia (RCA CTC2-3726). Both are excellent (though they are very different from each other), and their appearance is occasion for rejoicing, because it suggests that Mahler's Tenth is at last about to take its deserved place in the standard repertory.

William H. Youngren teaches English at Boston College and has written on the subject of music for several journals.

Mahler, especially the Mahler of the later years, has usually been pictured as a morbid, death-obsessed neurotic whose last works constitute his quite conscious farewell to the world. Evidence for this view may be gathered not only from the memoirs of his widow, Alma, but also from certain remarks of Mahler himself and, most important, from his last two completed works, *Das Lied von der Erde* (1907–1909) and the Ninth Symphony (1909–1910). The last section of *Das Lied,* which is, in fact, titled *"Der Abschied"* ("The Farewell"), ends with the contralto soloist repeatedly (and hauntingly) intoning the single word *ewig* ("forever"), and the finale of the Ninth ends with the long, slow fragmentation of its main theme, until all that remains is silence. But the Tenth, on which Mahler began work in 1910, immediately after finishing the Ninth, is a very different work. Though he was to die in May of 1911, the Mahler we encounter in the Tenth is more a man returning to life than a man leaving it. Its finale is long, but it does not linger on and on—like those of *Das Lied,* the Ninth, and several earlier Mahler symphonies—as though Mahler could not bear to let us (and the music) go. Like the finale of the Ninth, that of the Tenth concludes with the fragmentation of one of its themes, but the effect is not at all bleak or disturbing, for the theme is a touching little folk-song-like melody, and its gradual breakdown is felt as a welcome release, a wry and loving, gentle but thoroughly unsentimental benediction. Moreover, the Tenth is filled with radiant and vital dance episodes, and its form is almost perfectly (and very satisfyingly) symmetrical: the first movement and the finale each take about twenty-four minutes; the second and fourth move-

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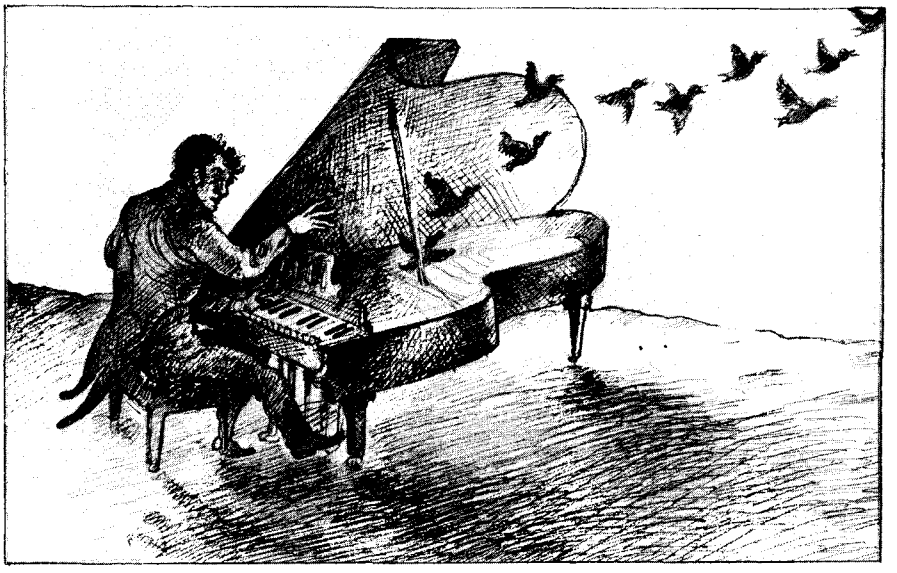
ments are both scherzos, each taking eleven to twelve minutes; and in the center sits a mysterious, ghostly little four-minute movement that Mahler for some reason labeled "Purgatorio."

My only quarrel with Levine's performance is that he assimilates the Tenth somewhat too closely to the world of *Das Lied* and the Ninth. Throughout the first four movements, his basic tempi are almost identical with Rattle's. But where Rattle is straightforwardly passionate, warm and eloquent, Levine is suave and silky, gravely elegant; and whereas Rattle plays the dance episodes with enchanting grace and lift, Levine holds them back a bit, so that they sound reflective, as though remembered in a dream. But it is in the finale that the two conductors really part company, Levine taking almost four and a half minutes longer than Rattle. Levine's performance, extremely slow and powerfully shaped, is most impressive. But much of the finale, like the little folk-melody I mentioned earlier, must move forward with more impulse than Levine gives it. He lets the music drift, and the ending is long-drawn-out, moribund, and beseeching, like those of *Das Lied* and the Ninth. The work's total effect is thus blurred, and Mahler's carefully devised symmetry thrown slightly off. Rattle, on the other hand, has the Tenth just right. His orchestra, though excellent, cannot compete with the Philadelphia: the strings lack the extraordinary sheen of the Philadelphia strings, and the ensemble as a whole is incapable of the subtleties of inflection that Levine produces from the Philadelphia, especially in the "Purgatorio" movement. Still, I would recommend Rattle's recording over Levine's. But the Tenth, even as completed by someone other than Mahler, is a great work—greater, I should say, than any of Mahler's extended works except *Das Lied*, the Ninth, and the Fourth—and anyone seriously interested in Mahler will want to have Levine's recording as well.

One other feature of Rattle's performance deserves mention. He has, as he informs us in the liner notes, made several alterations in Cooke's score, the most important being the omission of the second of the two loud drumbeats that join the fourth movement to the finale. Ordinarily, one objects to a conductor taking liberties with a score. But the score we are dealing with here, after all, is not Mahler's but Cooke's. And Cooke would surely have been the first to welcome such experimentation. Moreover, the Wheeler and Carpenter versions of the Tenth are both quite different—and in quite different ways—from Cooke's. We need to hear them as well as Cooke's version; conductors should feel free to transplant details from them into Cooke's; and other musicians should be encouraged to attempt new versions. Mahler's Tenth is a gem: the more facets of it we can glimpse, the better.



MAURIZIO POLLINI IS probably the best pianist in the world. His recordings of the standard repertory, especially of Chopin and of the Beethoven concertos and late sonatas, are as fine as any ever made. Over the past decade he has also been recording twentieth-century music, and now these recordings have been conveniently collected in a five-disc set, *Piano Music of the 20th Century* (Deutsche Grammophon 2740 229). The playing is uniformly splendid, with not a trace of the dismal coldness and rigidity that for so long marked the rare performances of this music, most of which were by "modern-music specialists" rather than by instrumentalists with Pollini's broad experience of earlier music. The performances in this set are likely to remain definitive for years to come, and therefore it should be acquired by anyone with the slightest interest in modern music.

The composers represented break down neatly into two groups. First there are the twentieth-century successors of the middle-European "nationalist" composers of the late nineteenth century: pre-1920 Stravinsky, Prokofiev, and Bartók. Then there are the avant-gardists: Schoenberg, Webern, Boulez, and Luigi Nono.

Stravinsky concocted the *Three Movements from "Petrushka"* for Artur Rubinstein in the summer of 1921, a decade after the ballet's premiere. It is a surprisingly idiomatic piano piece, and Pollini's brilliant performance makes it easy to forget that this music was ever scored for full orchestra. Indeed, once we have heard Pollini move from the percussive "Russian Dance" of the first tableau to the rustling and murmuring of the mummers' dance from the fourth, it seems that the tonal palette at his command is as rich and varied as that of an orchestra. Only the inappropriately boisterous concert-ending—tacked on in place of Petrushka's death music—mars this remarkable transcription.

Prokofiev's rather coarse and bumptious Sonata No. 7, Op. 83 (1942), is not one of his best works. I recall being amused once when a friend described it as "wall-to-wall music." But Pollini manages to get a good deal out of it, and the quiet, curiously Gershwin-like second movement is especially fine.

The side of Bartók that I find hard to take is the strutting, hectoring bully-boy—who usually arrives with a bagful of Magyar folktunes. Since this character is onstage more often in the Piano Concerto No. 1 (1926) than in the Piano Concerto No. 2 (1930-1931), I have always preferred the latter work. But the slow movement of No. 1, an odd, one-

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legged waltz for piano, percussion, and (intermittently) woodwinds, is very moving. All three movements of No. 2 are splendid: the genial and witty first movement, the rather spectral *Adagio-Presto-Adagio* second movement, and the joyous finale, with its canonic brass figures and unexpectedly lyrical middle section. Pollini's superb playing of both works is matched by that of the Chicago Symphony under Claudio Abaddo.

Schoenberg's solo piano music spans more than twenty years of his career and gives an interesting insight into his development as a composer. In the *Drei Klavierstücke*, Op. 11 (1909), we find him taking leave of tonality but still mired in all the worst mannerisms of post-Romantic tonal music: the heavy brooding, the sudden outbursts of hectic activity, the portentous pauses. Part of the difficulty is that the music simply goes on too long. Having denied himself the advantages of a tonal center and having confined himself to the sonorities of a single instrument, Schoenberg has little but the mannerisms to fall back on. That he sensed the problem is evident from the fact that he never again wrote a piano piece that was more than about half as long as the second one of Op. 11; and only two of the more successful *Sechs kleine Klavierstücke*, Op. 19 (1911), are over a minute long. The last of the *Fünf Klavierstücke*, Op. 23 (1923), is the first piece Schoenberg consciously wrote according to his newly contrived "method for composing in twelve tones"; but the whole work has a twelve-tone flavor, along with the rhythmic deadness common to so much twelve-tone music. Again, Schoenberg probably saw what had gone wrong, for he employed dance forms in all but one of the movements of the *Suite für Klavier*, Op. 25 (1924), with a considerable gain in rhythmic vitality and continuity. Finally, with the two *Klavierstücke*, Opp. 33a and 33b (both 1932), Schoenberg seems fully at home in the new idiom. These slight but thoroughly engaging and touchingly nostalgic pieces have a freedom and ease not found in his earlier piano music.

Schoenberg's disciple Anton von Webern published only one work for solo piano during his lifetime, the *Variations*, Op. 27 (1935-1936). It is in his usual late style, spare and elegant. Unlike Schoenberg, Webern seems never to have had trouble accustoming himself to the twelve-tone idiom; nor—a related point—does he seem to have had Schoenberg's deeply ambivalent relation to earlier music. From all accounts, Webern saw himself as a natural next step in the tradition of Beethoven, Schubert, Brahms, and Mahler—all composers, incidentally, whose works he frequently conducted. Consequently, he wanted his music played luxuriantly, spaciously, and with plenty of rubato—"Pauses sound good," he once told a pupil. His own estimated timings for his works, as preserved in his letters, almost always far exceed the length of any performance we have ever heard. The timing that appears in the score of the *Variations*, which is probably Webern's own, is ten minutes. Yet Pollini's performance, rich and expressive as it is, takes only a little over half that long. Webern's music, on the page, gives off an air of steely concision; but it is really a music of allusion to the great Austro-German tradition in which he saw himself firmly placed and to which he constantly referred in his teaching. I wonder what allusions would emerge from a ten-minute performance of the *Variations*, in which the pauses were allowed to do their full work of suggestion.

The post-World War II musician who did the most to establish Webern as the member of the Schoenberg-Berg-Webern triumvirate most useful to young composers was Pierre Boulez. Yet already in Boulez's Sonata No. 2 (1948) we are in a world very different from Webern's. For one thing, the sonata takes about half an hour—a length unheard of in Webern's output. Also, it is very elaborate, even florid, and there is a delight in the sheer richness and variety of piano sound quite foreign to Schoenberg and Webern, and indeed not evident in important music after Debussy—whose presence, incidentally, is often felt in the Boulez sonata. This is a fascinating, hellishly difficult work, and I do not know it well. But Pollini's performance is clearly superior to the few others I have heard, not only because of its brilliance and bravura but also because of the unobtrusive care with which the structure of each complex movement is articulated.

Finally, there are two works by Nono, which employ prerecorded tape as well as piano. Since these make no sense to me, I cannot comment on the performances. But I don't want to end on a sour note. This splendid set makes one

July report on

ATLANTIC MONTHLY PRESS BOOKS

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—Isaac Stern

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GIVE US A GREAT BIG SMILE, ROSY COLE

by Sheila Greenwald

$7.95 at your bookstore

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hope that Pollini will soon record Berg's Sonata, Op. 1 (1908), which he has been playing in his recent New York recitals, and also the Piano Concerto (1964–1965) of Elliott Carter. It is a joy to hear the music of our own time interpreted by a musician so thoroughly rooted in the greatest music of the past.

IF POLLINI IS INDEED the best pianist in the world, a strong candidate for runner-up is Vladimir Ashkenazy. To my ears, Ashkenazy's playing does not have quite the magnetic concentration and overarching power of Pollini's, but it is great playing nonetheless. Its outstanding characteristics are an unforced naturalness and warmth, an utter lack of quirkiness, and an ability always to provide new insights into the music. Ashkenazy's assurance and consistency make it clear that every detail has been carefully thought out; yet his spontaneity and unpretentiousness ensure that nothing ever sounds contrived or studied. All these characteristics have been present from the first in his fine series of Beethoven sonatas, recorded for London; and they are present in the two latest additions to the series, which now approaches its end.

London CS 7191 has three fine early sonatas: Op. 7 in E-flat; Op. 14, No. 1, in E; and Op. 14, No. 2, in G. Though Op. 7 is Beethoven's fourth sonata, it is the first in which he really hit his stride as a composer for solo piano. The three sonatas that make up Op. 2, though they exhibit all the elements of the mature Beethoven style, are doggedly garrulous and imperfectly formed; in Op. 7 we get, for the first time in the piano sonatas, Beethoven's unique fusion of concentration and power, with four large and well-defined movements brilliantly played off against one another and not a note wasted. Ashkenazy's performance is superb except for the first movement, which he plays too slowly and thoughtfully to catch the robust wit and verve of the music. The two Op. 14 sonatas, each of which has only three movements, are gallant and charming works. Initially, Ashkenazy's tempi for the first two movements of No. 1 sound too fast, but they sound better as he uses them to reveal a passion one had not known was in this music.

London CS 7192 has four extraordinary sonatas that are often neglected: Op. 54 in F, Op. 78 in F-sharp, Op. 79 in G, and Op. 90 in E minor. Op. 54 tends to get lost in the shuffle, because it stands between two giants, the *Waldstein* (Op. 53) and the *Appassionata* (Op. 57); the other three are overshadowed by the *Appassionata*, which immediately precedes them, by the five last sonatas, which immediately follow them, and by *Les Adieux* (Op. 81a), which flourishes in their midst. These four transitional sonatas are all quite short, three of them having just two movements and the fourth (Op. 79) only three. Not surprisingly, they are filled with abrupt contrasts in texture and mood that strikingly anticipate the last sonatas and the late bagatelles. The only tempo that at first sounds wrong, the slow first-movement tempo for Op. 90, slips into place as it turns out to reveal hidden depths in the music. All these performances are above reproach; but if I had to single out one movement for special praise, it would be the gently reflective, almost Schubertian second movement of Op. 90, which Ashkenazy plays with an openness and simplicity that take one's breath away.

ANOTHER VERY DISTINGUISHED series is the one of late Haydn symphonies being done for Philips by Colin Davis and the fine Concertgebouw Orchestra of Amsterdam. The two most recent records offer Nos. 86 in D and 98 in B-flat (Philips 9500 678), and Nos. 101 in D (*"The Clock"*) and 102 in B-flat (Philips 9500 679). Ever since I first heard Davis conduct a Haydn symphony, almost thirteen years ago in Boston's Symphony Hall, I have been convinced that he is the greatest Haydn conductor since Toscanini; nothing I have heard since has in any way weakened that conviction. No other living conductor so surely and so consistently catches the unique combination of intelligence, high spirits, nobility, wit, and sweetness that characterizes Haydn's last great symphonic works.

Listening to these two new records, I was astonished again and again by the absolute rightness of Davis's tempi and by his uncanny ability to bring out the often underrated brilliance of Haydn's scoring—listen, for example, to the way in which the woodwinds add an unexpected poignancy to the lumbering peasant dance that forms the trio of the minuet of No. 86. There is virtually nothing to object to in these performances: the first movements and minuets are appropriately weighty but never static or stolid; the slow movements are full and eloquent; the finales dash. If Davis does not achieve the miraculous incandescence that Toscanini achieved in the finale of *"The Clock"*—well, nobody else has ever achieved it either. The playing of the Concertgebouw is at its usual high level, though occasionally the violins are a bit ragged. But to my surprise, I found the recorded sound a little unsatisfactory: there seems not enough middle to it, and the winds are miked too closely. But this is a minor complaint: these performances, like their predecessors and, probably, their successors in the series, are likely to remain definitive for a long time.

ANYONE WITH AN interest in Haydn ought to listen to the music of Carl Philipp Emanuel Bach, the most gifted of Bach's sons and the first composer to have an influence on Haydn. The six Prussian Sonatas (Wq. 48), which were composed in 1740 and which Haydn got to know in 1749, just as he was beginning his career as a composer, are now available in a very fine performance by the harpsichordist Bob van Asperen (Telefunken 6.35460). The emotional intensity, the daring and occasionally wild experimentalism, and the extreme rhythmic and harmonic contrasts that mark these works not only tell us a

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good deal about where Haydn came from but also make the works themselves fascinating and moving.

Another fine C. P. E. Bach work is the B-minor Sonata for Violin and Obligato Harpsichord (Wq. 76), which is beautifully performed by the Baroque violinist Carol Lieberman and the harpsichordist Mark Kroll on Titanic Ti-90. Unlike so many performers on the Baroque violin, Lieberman does not sound as though she were doing her bit for "authenticity" but secretly yearning to get back to the brilliance and power of a modern fiddle. Her playing is technically flawless and rhythmically vital; listening to her, one can quite easily—and, of course, incorrectly—believe that she has never played any other sort of violin.

The record is filled out by three slightly less interesting sonatas by C. P. E. Bach's younger brother, Johann Christian, who had an important influence on the young Mozart.

Let me close with a word about Titanic Records. It's a small company—in fact, a one-man operation, run by the engineer-producer Ralph Dopmeyer in Cambridge—but anyone interested in Renaissance and Baroque music should certainly explore the Titanic catalogue. On all the Titanic releases I have heard, the music and artists have been chosen with great taste, the performances have been exemplary, the recorded sound has been sharp and ungimmicky, and the surfaces have been far quieter than those of most major companies. Even the record jackets are handsome and informative. Besides the C. P. E.-J. C. Bach record just mentioned, notable recent releases include: Haydn keyboard sonatas superbly played on a modern replica of a 1780s fortepiano by Malcolm Bilson (Ti-51 and Ti-52); the first known piano sonatas, by Ludovico Giustini, played on the oldest surviving piano (1720) by the great Mieczyslaw Horszowski (Ti-78 and Ti-79); and Marin Marais's fascinating and little-known *La Gamme et autres morceaux de simphonie (The Scale and Other Ensemble Pieces)* of 1723, played by the excellent Boston Museum Trio: Dan Stepner, Baroque violin; John Gibbons, harpsichord; and Laura Jeppesen, viola da gamba (Ti-71). Those who cannot obtain a Titanic catalogue from their record dealer should write to Titanic Records, 43 Rice Street, Cambridge, Massachusetts 02140.

BOOKS

CRITICAL CONDITION

BY JOHN SIMON

FEROCIOUS ALPHABETS
by Denis Donoghue. Little, Brown, $13.95.

AT THE TIME WHEN moron jokes were still permissible and fashionable (I stress this point to remind you of the mutability of fashion and taste), there was one that went as follows. A moron stands atop a ladder painting a wall; a second moron holds the ladder. The second moron says to the first: "Hold on tight to your brush. I am about to remove the ladder." I thought that this was mildly funny until I started reading modern literary criticism. The modern literary critic, confronted with this joke—or, rather, this "text"—would say, in utmost earnest, "I understand the Second Moron perfectly. There are at least three ways in which his statement makes good sense. The first way, or the code of *techne*, proceeds from the relativity of science: in theory, and therefore possibly in *praxis*, the law of gravity could be suspended, along with the First Moron. Second, by the code of *nous*, we know the power of mind to be boundless; if the First Moron can believe strongly enough in it, he may either actually levitate or at least believe himself (provided he hasn't broken his neck) in a state of suspension, and faith is the only true reality. Third, according to the code of *maya*, Indian mysticism teaches us that the world is an illusion; hence the wall and the ladder, suspension and fall, are all equally illusory and interchangeable.

Obviously, much is gained by this neocritical interpretation, or "reading," of the joke; the only thing that is lost is the laugh. Since I, alas, remain an obdurate believer in laughter, particularly when confronted with the likes of such critics as Roland Barthes, Jacques Derrida, and Harold Bloom, I am quite the wrong person to have been sent Denis Donoghue's *Ferocious Alphabets* for review. Although I have great esteem for Mr. Donoghue as writer and critic, I cannot, like him, take seriously some of the critics he examines in this survey. But I think that books should not always be reviewed by those for whom they are right. *Habent sua fata libelli*, wrote Terentianus Maurus well before the invention of formal book reviewing; thereafter, it seems even more proper that books should have their fates—quirky and unpredictable, like human destinies. I think it is good for books sometimes to be reviewed by people who cannot understand them; just as it would be bad if the Second Moron's statement were reviewed only by persons who can understand it.

Not that all of *Ferocious Alphabets* is unduly abstruse, vague, or complicated. It starts out as a jaunty book about words, language, reading. The title derives from Wallace Stevens's "The Pure Good of Theory," and is meant to encapsulate the fierce ideological strife among rival contemporary critics. But that comes later. First we have reproduced six five-minute talks that Professor Donoghue delivered over a BBC radio program called *Words*. These six initial segments are charming, provocative, fraught with suggestive reverberations. They are the insights of a gifted Irishman, the heir of Yeats, Joyce, and Beckett, working in the humble field of the essay, but still one of those inspired Hibernians for whom gabbiness is next to godliness. The first talk concerns the word *findrinny*, of Irish origin, which had a brief but exalted literary career, then went underground, and may yet bounce back into life. The fourth takes up Donoghue's pawky mistrust of *one* in the sense of *you*, as in an Oxford don's "one finds oneself standing above a grassy bank," because of the snobbery he detects in it. (Even if you disagree, this is a marvelous mini-essay.) The sixth adverts to an English couple who gambled their way to sudden wealth, and then (in life, probably; in a teleplay about them, certainly) proved unable to enjoy their riches adequately because they lacked a commensurate language

John Simon is the drama critic for New York *magazine and the film critic for* National Review. *His most recent book is* Paradigms Lost.

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with which to conceptualize, express, and truly grasp what they had.

Chapter 2 is a commentary on the six broadcasts, an expansion and partial amendment of them, not especially electrifying but useful as a bridge to the next chapter, which distinguishes among communication, communion, and conversation, with Donoghue plumping (if I understand him correctly) for the latter two, and for the strategies by which a writer is able to achieve them. The best moment in this brief section is the casual remark that culture "is in any event a compensation for the frustrations attendant upon biological life," a fascinating concept that does not receive full treatment, even though Chapter 4 is entitled "Style as Compensation." Here Donoghue examines what used to be called the "tone" of various critics somewhat earlier in time or outlook—yesterday's modernists, such as John Crowe Ransom, R. P. Blackmur, Hugh Kenner, I. A. Richards, William Empson, and T. S. Eliot—and then leads into a newer dispensation with the eponymous William H. Gass. There are many shrewd aperçus, as when Donoghue observes that Kenner's "chirographic deliberation" and "an amanuensis of verity" are phrases that no voice has uttered, and only a typewriter could secrete. Empson's tone is apprehended as "a quiet chat with a few friends, decent English agnostics free of piety, except piety in favor of England and agnosticism." Here Donoghue's tone is Irish Catholic mockery, but why shouldn't it be granted its say as long as it is pertinent as well as pert?

In this chapter, as in all others, Donoghue brings in many additional writers (mostly, but not exclusively, critics), and attests to his varied, voracious, and victorious readings of numerous arcane texts. His concern is with the critical strategies used to buttonhole the reader, and also with how the writer satisfies his own needs, as when Eliot's use of the dialogue form is perceived as helping him be honest with himself. All this abuts on Gass, who "offers, instead of wisdom, an exhibition of skill," and points the way toward some truly ferocious critical alphabets from abroad and home, to be investigated later.

Chapter 5 introduces one of the two Donoghuan categories of reading (but "reading" here means also critical endeavor)—Epireading, which our author, making somewhat heavy weather

of what is reasonably perspicuous, worries through a variety of fiercening definitions. But, then, he wants his own alphabet to have some mordancy, too; if not the ferocity of a deconstructionist tiger, at least the bite of an Irish terrier. It all begins with Socrates' dialectical method, and proceeds through sections on G. M. Hopkins, Georges Poulet, Kenneth Burke, Paul Ricoeur, Richard Poirier (I don't quite see how he fits into this august company, but I suppose the claims of friendship are not to be dismissed), and Harold Bloom, and, once again, the last-named is the most dubious and troubling of all. In their sundry ways, these epireaders believe, it seems, in a "voice" to be heard in the writing and its reading, and in a personality, however relative and incomplete, embodied by that voice. The term "epireading" is derived from *epos*, meaning speech or utterance; it is "a personal encounter," the "advantage of literature [being] that it makes a more complete meeting possible," even if "the other we meet is virtual rather than actual."

Here the going gets rougher, and Donoghue is not always so clear and persuasive as I would like him to be. For example, he does not show me how in his description of *Coriolanus*, Kenneth Burke goes significantly beyond Aristotle, and an attempted demonstration of the expansion of Burke's ideas through the ingestion of the anthropologist Malinowski fails to prove compelling. With Ricoeur we are, without preparation, immersed in a debate with structuralism, and we have to proceed with seven-millimeter boots. But it is not until we reach Harold Bloom that things become impenetrable. The fault is not Donoghue's but either Bloom's or mine. I understand Bloom's basic theory—the need of the new poet to take on an earlier one and conquer his influence—though I do not fully believe it, at least not when Bloom starts talking about "revisionary ratios" such as *clinamen*, *tessera*, *kenosis*, *daemonization*, *askesis*, and *apophrades*, and begins to drag in the Kabbalah, to "chart the crisis by marking. . .certain places or 'crossings'. . . ." One such "crossing is between metonymy and hyperbole, 'or [here Donoghue resorts to direct quotation] defensively between regressive and isolating movements of one's own psyche, and the massive repression of instinct that sublimely augments one's unconscious or inwardness at the expense of all the gregarious affects.' " Another crossing, "the crossing of identification, which faces death itself," takes place "between metaphor and metalepsis" and is explained by a quotation from Bloom even more obscure than the foregoing.

The problem, I repeat, is not with Donoghue, who has struggled with and actually wrested a mite of meaning from Bloom. No, the problem is with the willful, unjustifiable opacity of the texts. Donoghue's explications, meant to be short and relatively simple, end up sounding either too facile and incomplete or just as cryptic as the matter they aim to elucidate.

Things become really thorny and unnegotiable—at least for so feeble a machete as my cognitive faculties—when we get to Graphireading (Chapter 6), i.e., texts that do not transcribe "an event properly construed as vocal and

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audible." Here the text becomes a set of visual signs for the reader-critic to play with; it enables him to mobilize his own ingenuity in shedding obscurity and complication upon it without ever betraying the *graphos* (writing) into becoming a mere human utterance. The masters discussed here are Mallarmé (though he, as a poet, seems to me entitled to make demands that the others, as critics, are not), Derrida, Barthes, Paul de Man, and Lucette Finas, and they make the Second Moron sound like a paragon of common sense. Let me quote, for example, two of the five codes that Barthes invokes in the reading of a text, as paraphrased by Donoghue: "Third: the symbolic code, which is the place for reversibility and multivalence. This is the code that gives richest scope for play, since it is a field that can be entered at any point or at any number of points. What it chiefly subverts is depth or secrecy. Fourth: the proairetic code, which entertains actions falling in various sequences; the sequence is an artifice of reading, because the reader brings events together under various convenient names. It is this code, apparently [note the incertitude!], that is mainly responsible for plurality, since it allows the reader to list the actions in whatever sequence happens to suit his temper."

Donoghue does not make clear—nor, I imagine, does Barthes—how the reversibility and multivalence of the symbolic code (which subvert secrecy, though symbolism, I should think, permits mystery to flourish) differ from the plurality of the proairetic, and how the scrambling of sequences differs from entering the text at any number of points. Or, indeed, what any of this really means. As we get deeper into structuralism, semiotics, deconstructionism, and the rest, we find, for instance, Umberto Eco trying "to break the notion of the sign altogether and to replace it by sign functions and sign production." Such inscrutability is not explained for me by "binarism [having] become an embarrassing dogma because the only binary model available is the phonological and therefore the phonetic one, and in phonology the binary choice has to be applied to separate entities." Yet even this is child's play compared with Jacques Lacan's "The signifier is what represents the subject for another signifier. . . . Only the relationship of one signifier to another signifier engenders the relationship of signifier to signified."

In the final, seventh, chapter, Donoghue is at first emboldened to choose Epireading over Graphireading, but then, as if taken aback by his own daredeviltry, opts for retaining "the opposition as rival forces within our minds." Here, incidentally, he makes the apt pronouncement "that literary critics in our time are lunatics of one idea, and . . . are celebrated in the degree of the ferocity with which they enforce it." Or, you might say, they are like my First Moron, acclaimed according to how persuasively they can make their paintbrushes hold them aloft after their ladders have been carried away.

The tendency of philistines like me is to dismiss the critics from Barthes onward as emperors without clothing. But as Burnier and Rambaud in their magisterial *Le Roland-Barthes sans peine* (a textbook that teaches us how to write in Barthes in eighteen easy lessons, complete with questions and written exercises) have implied, we are really confronted with clothing without emperors. What we have is obscurantist integumenta, techniques of obnubilation, underneath which there is little or nothing. Criticism, which once served the noble purposes of elucidation, explication, education, has turned instead to attitudinizing, mystification, and self-glorification of the most megalomaniacal sort. Since it is harder and harder to be both innovative and lucid, naturally it is lucidity that must go.

The aim, as certain recent writings by Bloom and Geoffrey Hartman have made clear (this, by the way, is the only thing they have made clear), is to arrogate to the critic the prestige and privileges of the "creative artist." Though they mean mostly poets and novelists, the analogy seems to be at least as much with abstract painting and post-Webernian music. But though I would be the last person to dispute the idea that criticism is an art, it is to a great extent an art as good teaching is an art, or as a poem that makes inroads on abstraction is art. When criticism becomes more obscure than the work it purports to illuminate, it is of no value to me: as useless as painting from which all living forms, or music from which all vestiges of melody, have been banished. And more dishonest, for painting and music never promised us explanations.

I have great respect for Denis Donoghue's earlier books; in *Ferocious Alphabets,* however, the author becomes, in part, contaminated by what he deals with: sometimes unduly opaque, and sometimes too lenient with phenomena deserving of the ferule. Thus, when he correctly demonstrates how Paul de Man, after describing a huge and hugely complicated metacritical circle, arrives at his starting point, which is precisely where he did not want to end up, Donoghue calls this "a touching moment." I think the procedure is more touched than touching, and even Donoghue is forced to wonder "what was the purpose of the exercise?" In fact, Donoghue is rather like the chap who wishes things were simpler, plainer, clearer, but feels he must accept tortuous and torturing complexities merely because they are there. Well, unlike the thereness of Mount Everest, that of recent criticism need be neither climbed nor accepted: it can simply be booted away. As I suggested, fashions in jokes have been known to change. □

Making It Strange

BY JOHN BAYLEY

PRETENDER TO THE THRONE
by Vladimir Voinovich. Farrar, Straus and Giroux, $12.95.

ANY NATION'S BEST and most pungent humor usually doesn't travel well. Like poetry, it gets lost in translation, both in the literal sense and in terms of acoustic nuance—those numerous verbal gestures and tropisms that encrust a culture. The subtlest humor is, as the structuralists would say, metonymic: it presupposes a linkage of anticipated connections with one abruptly left out, or with a link to some quite different set of expectations. We must have an unconscious and atavistic awareness of this mechanism, an awareness dictated by class and culture, for the element of surprise to have its full effect.

Vladimir Voinovich's lighthearted, picaresque new novel prompts such reflections. *Pretender to the Throne,* the successor to *The Life and Extraordinary Adventures of Private Ivan Chon-*

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kin (1977), is a further installment of Chonkinian fantasy by this celebrated and controversial writer, whose skirmishes with official Soviet policy culminated in his departure from the country last December.

In its comparatively brief span, Russian literature has produced many satiric masterpieces: Pushkin's *Tales of Belkin*, Gogol's *Dead Souls*, Saltykov-Shchedrin's *Provincial Sketches*—to name only a few. Dostoyevsky was a virtuoso of grotesque comedy. Tolstoy, a much cooler genius, imported from Europe the device described by the Russian formalist critic Viktor Shklovsky as "making it strange." When, for example, Natasha, in *War and Peace*, attends the theater for the first time, Tolstoy evokes only the actors' mechanical motions—"the singer waved his legs about a good deal and sang something in a high voice"—thus literalizing into ludicrous travesty a complex ritual that depends for its success upon a collective suspension of disbelief. In this way, we are made to view a familiar transaction in a new light and as if for the first time. Tolstoy borrowed this technique from Voltaire, who makes the innocent eye of Candide unable to adjust to the collective hallucination required by such human activities as warfare, patriotism, and religion. Instead of being inspired by the sight of soldiers playing a martial air on a drum, he can see only "murderers six foot high clad in scarlet and beating on a distended ass's skin."

Voinovich inherits and uses the same technique. His Chonkin owes something to the old Russian tradition of Ivan the Fool, the holy simpleton of folk tales, but he is still quite a familiar figure. Indeed, there is something distinctly *déjà vu* about him, which may make the Western reader somewhat less than enthusiastic about his adventures.

When a novel ridicules the Soviet system by conjuring up an ordinary citizen oppressed by bureaucracy, we tend to be sympathetic; but that doesn't mean the novel is a masterpiece. There is something a little patronizing in our enthusiasm for Chonkin; it is as if the Russians finally caught on to a type that we have long since recognized as universal.

Such condescension, however well-meaning, hardly does justice to the peculiar nature of Voinovich's talents. Like Gogol, he is both a humorist and a poet—traits difficult to put across in translation, though Richard Lourie has done a valiant job. Besides, Chonkin is only a convenience, and in this sequel he figures a good deal less than in the original novel, disappearing for pages at a time while his creator gives the full satiric treatment to the fantastic world of wartime Russia, where there is not only no heroism but no fighting. The Catch-22 element runs riot, just as it did in Alexander Zinoviev's monumental ragbag of a novel, *The Yawning Heights*.

There is an idyll in the background of most satires. Bureaucratic and ideological nightmares may seem inescapable, but the garden of Eden still exists somewhere. Private Chonkin's idyll began, readers of the first installment will recall, when he was sent by his sergeant to guard an aircraft that had crash-landed near some remote village. There he was befriended by a buxom local lass and settled down to a life of pristine simplicity. This primitive Eden would always have been enough for him; he would never have had an urge to bite the apple and confront the challenge of Soviet civilization.

The sharp division between modern Soviet man and an unchanging rural background obsesses Voinovich. But where the adventures of Chonkin are concerned he treats it in terms of farce. When the army comes to investigate what is going on in the village, Chonkin, true to his orders to guard the crashed plane, mistakes the investigating soldiers for bandits and fends them off. At the opening of *Pretender to the Throne*, we find him under arrest while his mistress goes from one office to another in the hope of obtaining his release.

The Chonkin case soon prompts a spate of bureaucratic fantasies. It seems that a Prince Golitsyn once owned the village Chonkin came from, and perhaps Chonkin is really a changeling, a prince in disguise (hence the book's title), dedicated to the overthrow of Soviet society. Or perhaps he has been leading the notorious Chonkin detachment of White Guards? Such notions thrill the bureaucrats, intent as they are on the virtually incompatible goals of winning prestige from the case and passing the buck further on up. Meanwhile the Germans invade, and in the ensuing war fever news of the Chonkin affair travels swiftly to the Kremlin and engages the attention of Lavrenty Beria, the OGPU chief, and then of Stalin himself. Even Hitler hears of it, and gives orders for a tank column to change direction in order to rescue the gallant prince, who as an anti-Bolshevik may be a potential recruit for the Nazi cause. Eventually, however, the higher-ups tacitly agree that Chonkin is best forgotten about, and at the end of the novel the hero heads home to the village and his mistress, only to find it occupied by the Germans, who are making the same threats and promises to the local inhabitants that the Soviet commissars used to make.

PRETENDER TO THE THRONE recalls the late Alexander Tvardovsky's *Vasily Tyorkin*, an immensely popular verse narrative about the adventures of a

John Bayley is Thomas Wharton Professor of English Literature and Fellow of St. Catherine's College at Oxford. His books include Tolstoy and the Novel *and* The Character of Love.

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simple Soviet soldier during World War II. Tvardovsky, the strange and tormented editor of *Novy Mir* who bulks so large in Solzhenitsyn's gigantic memoir *The Oak and the Calf*, was the darling of a regime to which he owed everything; yet in Solzhenitsyn's account he appears as a pathetic martyr, torn between his loyalty to the system that had made him what he was and his passionate commitment to good writing—the very kind of writing that the system prevented him from publishing in his magazine.

This sort of anguished contradiction isn't usually found in émigré authors, who can solace their homesickness by attacking with the most wholehearted contempt and ridicule the regime that has expelled them. Yet Tvardovsky's Tyorkin and Voinovich's Chonkin would get on: they are essentially birds of a feather, even though Tyorkin is a war hero—one of the few convincing ones in Soviet hagiography—and Chonkin the instrument of an anti-Soviet propagandist. Having been created by artists, both are true in themselves despite the polemical purposes for which they were made—truer, oddly enough, than the simple soldier of *War and Peace*, Platon Karataev.

In their own ways, both Tyorkin and Chonkin reveal the virtues of the Russian character, virtues that in the one case are brought out and glorified by the communist system and in the other continue to exist in spite of it. But for Voinovich, this effect is accidental; like any satirist, he would be lost if he tried to transform a negative attitude into a positive one. His dilemma echoes that of Gogol, whose portrait in *Dead Souls* of human evasiveness and inertia—everything that Russian syntax comprises in the phrase *ne to*—reveals by negation our natural preference for living in a world of unreality, a world in which the notional and the nonexistent absorb all aspiration and vitality. Yet his attempt, in a sequel, to reform his hero, direct him to useful activities, and encourage him in positive thinking was a disaster, and Gogol burned the manuscript in despair.

More than a hundred years later, the exponents of socialist realism are still finding out how difficult it is to encourage and portray the civic virtues. Traditionally, Russian literature has polarized a situation endemic in Russian society: in one novel after another, the

Answers to the June Puzzler, **"BREAKING IN"**

1 P	A	2 (L)	M	4 (I)	S	5 T	6 P	7 L	E	8 (F)	9 A
10 (E)	P	R	E	T	T	(I)	E	(S)	T	I	D
D	11 R	E	N	12 R	E	(M)	(A)	A	I	N	(D)
13 A	(E)	D	(U)	O	R	E	14 S	T	I	(P)	E
15 L	I	(O)	S	T	16 P	A	17 (F)	(I)	18 F	E	(N)
19 (T)	N	U	20 R	S	(E)	R	Y	E	I	S	D
R	F	B	E	21 M	(R)	E	D	(R)	(U)	S	A
22 O	(P)	(T)	T	23 S	O	D	24 F	25 L	A	(I)	26 B
27 (O)	O	M	A	(N)	28 F	E	L	I	(S)	N	E
29 (W)	R	E	(S)	T	I	N	(G)	M	C	G	G
P	C	30 H	(I)	E	(L)	L	E	(B)	O	R	E
31 S	(E)	A	L	T	32 T	A	X	E	(R)	S	(T)

"Life is made up of interruptions." (W. S. Gilbert)

Across. 1. PAL-MIST 6. P-LEA 10. PRETTIEST (anag.) 12. R(EM)AIN 13. ADO-RE 14. ST(udy p)IPE 15. LIST (double def.) 17. FIFE (double def.) 19. NUR-SERY (*run* rev. + *ryes* anag.) 21. MEDUSA (anag.) 22. O-PTS 24. F-LAB 27. O-MAN 28. FE(L-IN)E 29. WRESTING (hidden) 30. HELLEBORE (anag.) 31. SALT (anag.) 32. TA(XER)S (rev.)

Down. 1. PE(D)AL 2. REDOUBT (pun) 3. MEN-US 4. T(a)ROT 5. TEA-RED 6. PEAS (anag.) 7. LA(T)ER (rev.) 8. FINES-SING 9. ADDENDA (anag.) 11. REIN-FOR-CE 16. PROFIT (homophone) 18. FIASCO (anag.) 19. T(ROOP)S (rev.) 20. RE-TAIL 23. STET (pun) 24. FLEX (homophone) 25. LIME (double def.) 26. BE(G)ET

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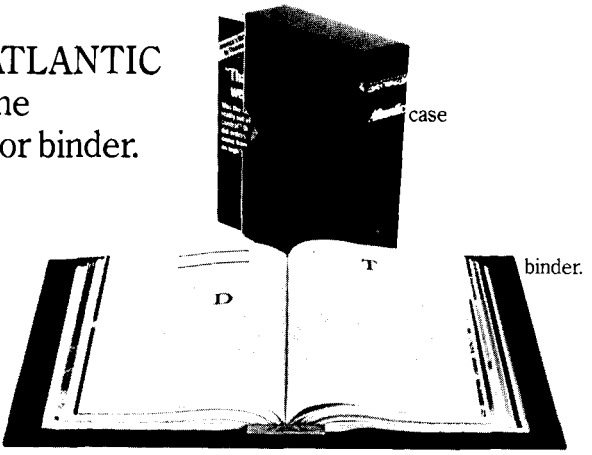

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longing for order, for *pravda,* is balanced by an equally profound nostalgia for unregenerate secrecy and chaos. Today, however, the nature of that polarity has changed. "Order" has assumed an ideological form; and its opposite has no choice but to appear in the guise of a negative or counter-ideology. The worst disservice that Soviet doctrine has done to literature is not so much to have incubated a whole class of dreary conformist authors but to have compelled the truly talented to spend their whole talent on being against that doctrine.

The result is a peculiar form of parochialism, which even Solzhenitsyn shows signs of: a parochialism of protest. Again, the precedent is there; the literature of protest is a tradition in Russia. Turgenev's *Sportsman's Sketches* played as important a role in the emancipation of the serfs as *Uncle Tom's Cabin* did in the freeing of the slaves. Dostoyevsky's *Notes From Underground* began as a polemic against Benthamism and the Utilitarian quest for the greatest good of the greatest number. Even the majestic canvas of *War and Peace* started out as Tolstoy's answer both to the intelligentsia who execrated the patriarchal way of life of the old nobility and to the standard patriotic version of the events of 1812. But as these works acquired the immortality of great art, the local and polemical element ceased to matter.

In our own day, that element is frozen into a perpetual predominance. Voinovich, Zinoviev, and Andrei Platonov, to name only three of the most talented (and most "counter-revolutionary") of recent Russian prose authors, are dedicated to a species of protest that eventually takes over the whole work—its content, its form, even its language. Joseph Brodsky, the most distinguished Russian poet writing today and the most perceptive critic of Russia's literary scene, maintains in the introduction to an American edition of Platonov's work that Soviet "Newspeak" required a counter-language to neutralize and undo it, a counter-fantasy to the fantasy that serves as the official Soviet version of life in Russia. But there is something fatal in this logic, because it implies a kind of imitation: if you can't beat them, copy them. Soviet society, as Brodsky put it, "turns out to be capable of generating a fictive world and then falling into grammatical dependency on it." The same phenomenon befalls the protesting writer.

To be fair to Voinovich, it must be said that his world has a clarity and candor about it, an effect of getting back to fresh and simple things; it is closer to Gogol than to Platonov. But what all three of them demonstrate is the way in which society not only corrupts the natural man but liberates the primitive, predatory, unregenerate aspects of his nature. The hero of *Dead Souls* exploits the bureaucracy of serfdom, which its apologists would have said was intended to look after and protect the serfs. The socialists in Platonov's fantasy *Chevengur* have grown so accustomed to the doctrines of their strange world that they cannot conceive how anyone could actually love or feel concern for his neighbors and relatives; and they even go so far as to wonder whether a true communist system shouldn't endeavor to organize demonstrations of "artificial sorrow," supposing that the flavor of communism might be improved by a little salt.

One of Voinovich's characters relates how he used to denounce fellow Bolshevik workers, finding that the more talented they were the more unsuspicious: "To destroy talented people is the pleasantest and safest of tasks." Normal human envy found its happiest expression in this activity. And the most unsuspicious of all were the officials themselves: "There is no government more trusting in the world. No matter what nonsense I wrote they believed it." The informer had a bad moment when he protested to a superior that he was acting out of pure love of the cause. This created instant suspicion, until he hastily added that he had nothing against taking money for his services. The official nodded happily: "Of course it isn't the money any of us work for, but we are materialists and we don't hide the fact."

Snobbery plays an important part in the style of intrigue:

> After Chonkin was discovered to be of high birth his case was removed from among the ordinary cases, and it was directed "up top" . . . Before receiving those instructions the lower officials displayed a certain indecision which was reflected in the documents and other materials of the investigation, where Chonkin was called simply Chonkin, and the "so-called Chonkin," and in certain cases even "Chonkin the White." However, now there were occasional glimpses of the dual surnames Chonkin-Golitsyn and Golitsyn-Chonkin.

Chonkin's virtues are wholly negative: that is one of the most effective points Voinovich makes. Not only is he not against anything but he is in no sense warm or generous. Having no taste for revenge simply reflects his selfishness, his desire to be left alone with his mistress in the little village.

By not seeking to set up Chonkin as a symbol of "humanity," an honest Russian intended to serve as a rebuke to Soviet corruption, Voinovich has largely neutralized the novel's polemical force. But what would Tolstoy and Dostoyevsky have thought of it? It is an ironic comment on the ethical system promulgated by communism that the moral fervor so vivid in Russian literature should have dwindled—in its own service, so to speak—to a point where a serious author can recommend only the minimum of decent self-interest. □

Short Reviews

The Issa Valley *by Czeslaw Milosz. Farrar, Straus and Giroux, $12.95.* Professor Milosz's novel begins as though it were to be reminiscence in the third person—nostalgic memories of an idyllic rural childhood disguised as fiction—but proves to be something more complicated and more intriguing. Thomas, the juvenile protagonist, encounters as much trouble as he does pleasure, and all his experiences are like the water bugs that he watches, with bemused interest, skittering on the surface and the edges while the river goes its powerful and sometimes dangerous way. The Issa Valley is a place where, some centuries back, Polish gentry moved in to take control from the native Lithuanian population. The resultant social divisions and resentments have persisted into Thomas's time—just after World War I—as have the remains of pagan superstition. (The Lithuanians were the last people in Europe to accept Christianity.) Civil

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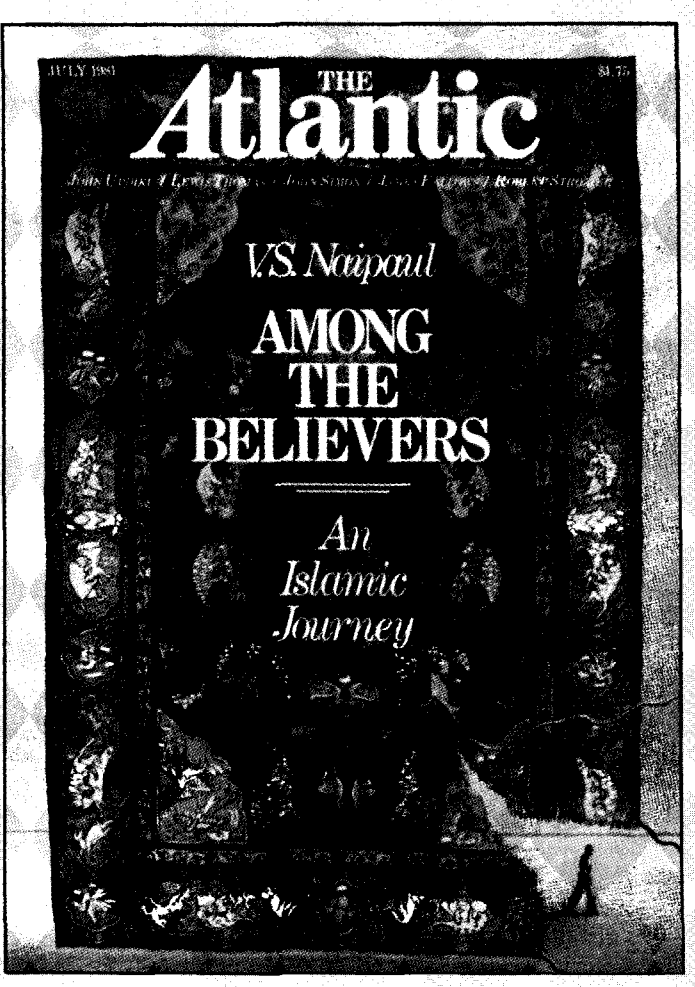

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war rumbles in the distance, land reform threatens the family property, the old class distinctions are disintegrating, and the rectory has a poltergeist. Since Thomas cannot be expected to comprehend all this confusion, the novel is written on two levels, moving from scenes involving the boy to episodes at which he is not present and which he would hardly understand if he were. The author is describing the end of a particular small world from two points of view—that of those fighting to survive and that of the bewildered young bystander. He does it coolly, lucidly, with affection and respect but without regret. Translated by Louis Iribarne.

Joan of Arc *by Marina Warner. Knopf, $17.95.* Ms. Warner's interpretation of Joan of Arc as a phenomenon of her own period is intelligent and plausible. The major interest of the book, however, comes in the latter half. There the author examines the shapes, physical and ideological, that have been imposed on Joan in subsequent periods, each century forcing her into its own notion of female heroism. That male heroes get similar treatment is not considered. Illustrations, index.

Solomon's Daughter *by C. E. Poverman. Viking, $12.95.* Solomon is a distinguished, successful, prosperous (naturally) surgeon. His daughter, Rose, is a nasty brat in adolescence, a muddlehead in maturity, and ultimately, thanks to a car crash that may have been deliberate, a cripple who is dependent, along with her children, on her now aging parents. This is where the novel starts, and the reader feels much sympathy for the bad luck of Solomon and his wife. But as Mr. Poverman moves back and forth through the family history, the situation looks less like bad luck than bad management, and then less like bad management than plain thick-skinned selfishness. Even selfishness does not, in the end, wholly account for Solomon and his family, for they seem to be pushed by a momentum of heredity or temperament that lies outside the scope of the novel as it lies outside control by the characters. As characters, however, they are utterly convincing, and their misery is powerfully conveyed.

Class *by Jilly Cooper. Knopf, $12.95.* Ms. Cooper is a British columnist, a position in which her battle-ax style of satire undoubtedly works very well. At book length it becomes heavy-handed, but her dissection of the English class system will nevertheless amuse Anglophobes and annoy Anglophiles. To the neutral reader, the best of the book will be a single page lifted from the Census office, which divides society into five classes according to occupation. Members of Parliament and chicken sexers turn up in Class II, inferior to accountants and vicars in Class I. Secretaries, photographers, and undertakers fall into Class III, "nonmanual skilled occupations," and raise interesting visions of pedal dexterity. Peers are not counted. One can meditate for hours on this list and never arrive at the slightest notion of who it is, and of what class, that runs the Census bureau.

Bogmail *by Patrick McGinley. Ticknor & Fields, $9.95.* The puzzle in this mystery is not who did the murder but which of the neighbors knows it and is blackmailing him. The setting is a remote village on the Irish coast, and the author provides so much diversion with fine scenery and so much amusement with daft discussions in the local pub that the clues he dutifully introduces slide by like mist on the wind.

Dorothy L. Sayers *by James Brabazon. Scribner's, $14.95.* Since Mr. Brabazon knew Sayers and has had the cooperation of her son and access to her papers, his book contains much more fact than earlier guesswork biographies and a great deal of lively quotation. This life does not alter the general shape of her story, but setting the mystery writer and religious propagandist firmly in the metamorphic society of the early twentieth century makes her actions and development understandable. Sayers becomes a recognizable product of her time, but not ordinary. Ordinary little girls fall in love with Athos. Sayers pretended to be Athos. Illustrations, index.

The Jefferson Scandals *by Virginius Dabney. Dodd, Mead, $8.95.* Exasperated by the recent revival, in two popular books, of the moth-eaten charge that Thomas Jefferson kept a slave mistress and fathered a litter of slave children by her, Mr. Dabney has written a testy, well-argued rebuttal of the so-called evidence. The story originated with a disappointed office-seeker who happened to be an irresponsible journalist, and Jefferson scholars have never taken it seriously. They do not need Mr. Dabney, while readers who get a kick out of discovering that historical heroes have clay feet will not believe him. The situation makes his sensible book a labor of hopeless love.

The Lord God Made Them All *by James Herriot. St. Martin's, $13.95.* The Yorkshire vet continues his amiable recollections of misadventure with ailing animals and dotty owners, throwing in a couple of trips abroad for variety. Since nothing Mr. Herriot undertakes—at least by his own account—ever turns out as predicted, these excursions are satisfactorily freakish. His admirers will not be disappointed.

Missing Links *by John Reader. Little, Brown, $19.95.* As a photojournalist, Mr. Reader is able to take a reasonably nonpartisan view of the discoveries and theories of paleoanthropologists. He presents a brisk, sober history of the search for evidence of human origins, keeping a straight face even when describing the Piltdown hoax and those squabbles over terminology that scientists conduct as though their lives depended on victory. (Since financial support may depend on victory, a certain belligerence is understandable, for fossil-hunting is expensive.)

Great Drawings of All Time: The Twentieth Century *selected and edited by Dr. Victoria Thorson. Created by Shorewood Fine Arts Books, published by Talisman, $295.00.* "Drawings" is to be taken rather loosely, for the two large volumes contain watercolors and pastels, among other types of work, and fairly blaze with color. Artists from every known school and group are represented. Geography includes Japan, Latin America, and Eastern Europe. Descriptions by suitable authorities introduce each section, the drawings are splendidly reproduced, and each plate is generously annotated. It would take years of travel and negotiation for a private enthusiast to see even half of this varied and fascinating collection, some of it never before reproduced and some of it normally kept in hiding. Seventeen essays, 528 plates representing 337 artists, bibliography.

—Phoebe-Lou Adams

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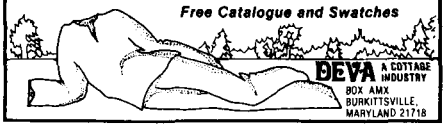

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THE ATLANTIC PUZZLER

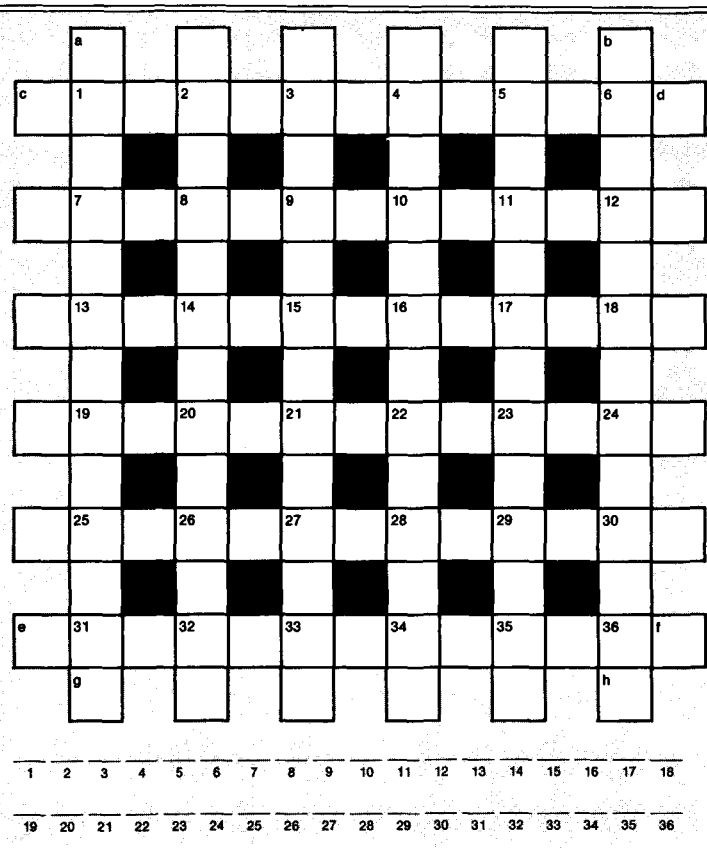
BY EMILY COX AND HENRY RATHVON

HIDDEN FACES

(Acknowledgments to Ad of *The Listener*)

The diagram shows cubes in rows of six, their top faces numbered 1-36, their four side faces unfolded to view, and their bottom faces obscured. Each cube has one letter on every face, and these six letters can be arranged to form a word (Cube Word). Overlapping side faces of cubes share the same letters. Letters on the 36 obscured bottom faces, taken in order, spell out a quote and its source. As an aid, clues are given for four 6-letter Edge Words (a-b, c-e, etc.) and six 6-letter Top Face Words (1-6, 7-12, etc.), to be entered normally. Answers include seven proper words. Punctuation may be used deceptively.

The solution to last month's Puzzler appears on page 87.



EDGE WORDS

a-b. You cryptic lovers
c-e. Mother love is man's primary creed
d-f. Crush a vegetable
g-h. Mix in steaming lentils

TOP FACE WORDS

1-6. Top Japanese pig with tan coat
7-12. Rock Hudson acts like a pest
13-18. Mad Hatter's menace
19-24. Relax and remodel
25-30. Roster lost in spa
31-36. Novelist's drunken stupor

CUBE WORDS

1. Last letter of bottom side's mysteriously unseen
2. Praise and laughter before wild game
3. Girl rolling log on creek
4. Norseman is number six ruler
5. Small is the sound of my salamander
6. Serious English writer
7. City with Henry's first church district
8. Encoded letter bit
9. After fifty, lousy but legal
10. Mann also keeps historical records
11. Inquire after mother's fabric
12. An honest figure?
13. Modern paintings left around Pennsylvania (*two words*)
14. Heroin ultimately changes characteristic of a champion
15. Supply data in plain formulae
16. Chaperone's corset burst
17. Commit a crime in greeting Mr. Benny
18. One dwelling in brute new city
19. Scared of Air Force attack
20. Arches in a series are sheltering a bad guy
21. School existentialist keeps quiet
22. Badly used or spoiled
23. Duels should be arranged just so
24. Stories of Belfast disturbed without end
25. A bit like trunks
26. Elizabeth Melville's husband?
27. Neighbors finally dug me out from a messy spot
28. Make nothing, Father, with this thingumbob
29. Misprints are art, in a way
30. Ornament diminished upon being reversed
31. Ornament Mom and Pop interlaced
32. Tedious drillwork
33. Note to the Beatles' drummer from an American in Mexico
34. Oxford accent
35. Salesman in basement, talking
36. Look at the boil

Note: The instructions above are the special instructions for this month's puzzle. It is assumed that you know how to decipher clues. For a complete introduction to clue-solving, write to The Atlantic Reprint Department, enclosing a self-addressed, stamped envelope.

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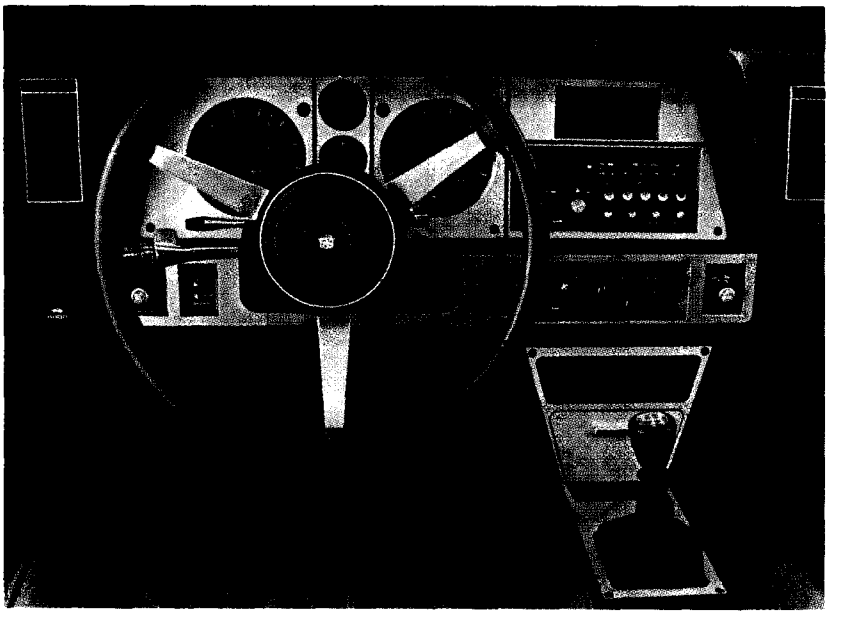

ANNOUNCING BY CADILLAC *Cimarron*

Quick-handling. Road-hugging. And fun to drive. This . . . is Cimarron. An efficient new kind of Cadillac. With the traction of front-wheel drive . . . MacPherson strut front suspension . . . and power-assisted rack and pinion steering with responsive 14:1 steering gear ratio. Plus, it has Cadillac refinements such as genuine leather seating areas, body-contoured bucket seats, air conditioning and more. All standard. Test-drive Cimarron by Cadillac. Due to limited initial production, Cimarron is not available at all Cadillac dealers at this time.

42 HWY. EST. 26* EPA EST. MPG

*Use estimated mpg for comparison. Your mileage may differ depending on speed, distance, weather. Actual highway mileage lower. Cadillacs are equipped with GM-built engines produced by various divisions. See your Cadillac dealer for details.

A NEW KIND OF CADILLAC FOR A NEW KIND OF CADILLAC OWNER.

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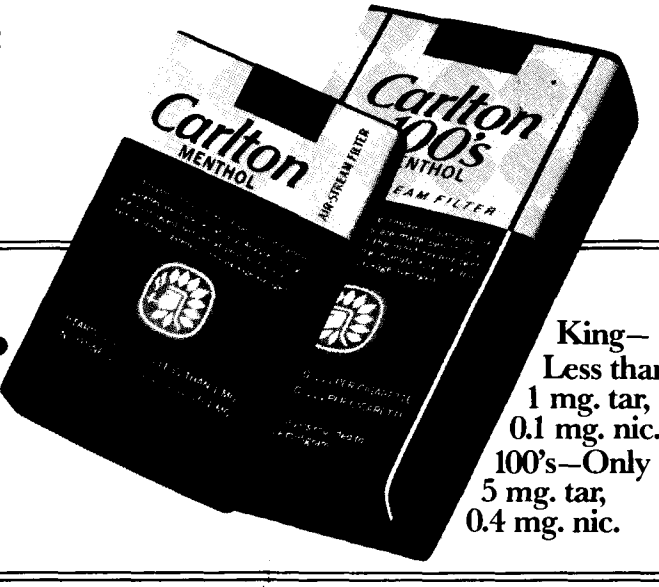
In either length—King or 100's:

Carlton is lowest.

Compare Carlton with U.S. Gov't figures for brands that call themselves low in tar:

	Tar mg./cig.	Nicotine mg./cig.
Benson & Hedges Lights 100's	11	0.8
Kent	11	0.9
Marlboro Lights	12	0.8
Merit 100's	10	0.7
Newport Lights	10	0.8
Salem Lights	11	0.8
Vantage 100's	12	0.9
Winston Lights 100's	13	1.0
Carlton Box (lowest of all brands)	**less than 0.01**	**0.002**
Carlton 100's Box	**1**	**0.1**



Carlton Menthol.

King & 100's

The lighter menthols.

King—Less than 1 mg. tar, 0.1 mg. nic.
100's—Only 5 mg. tar, 0.4 mg. nic.

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

Box: Less than 0.01 mg. "tar", 0.002 mg. nicotine; 100's Box: 1 mg. "tar", 0.1 mg. nicotine av. per cigarette by FTC method. Soft Pack: 1 mg. "tar", 0.1 mg. nicotine; Menthol: Less than 1 mg. "tar", 0.1 mg. nicotine; 100's Soft Pack: Less than 6 mg. "tar", 0.[illegible] mg. nicotine; 100's Menthol: 5 mg. "tar", 0.4 mg. nicotine, per cigarette, FTC Report Dec. '79.

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